



Non-Animal Alternatives Testing Global Market Opportunities And Strategies To 2030: COVID-19 Impact And Recovery

The Business Research Company

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Executive Summary

This report describes and explains the global non-animal alternatives testing market and covers 2015 to 2020, termed the historic period, and 2020 to 2025 termed the forecast period, along with further forecasts for the period 2025-2030. The report evaluates the market across each region and for the major economies within each region.

The global non-animal alternatives testing market reached a value of nearly \$1,569.4 million in 2020, having increased at a compound annual growth rate (CAGR) of 6.0% since 2015. The market is expected to grow from \$1,569.4 million in 2020 to \$2,315.5 million in 2025 at a rate of 8.1%. The market is then expected to grow at a CAGR of 11.9% from 2025 and reach \$4,069.1 million in 2030.

Going forward, rising healthcare expenditure, ethical concerns on animal experimentations, and rise in the number of research and development activities. Factors that could hinder the growth of the market in the future include stringent regulatory guidelines.

The global non-animal alternatives testing market is fragmented, with a large number of players. The top ten competitors in the market made up to 7.90% of the total market in 2020. The market consolidation can be attributed to the partnerships and collaborations among the players in the industry to save costs, enhance their product offerings and expand geographically. The market is expected to be concentrated state in near future with the adoption of acquisition and merger strategies by the players to enter and expand into newer geographies. Cyprotex was the largest competitor with 2.32% share of the market, followed by Bio-Rad Laboratories with 1.18%, MatTek Corporation with 0.99%, Emulate, Inc with 0.99%, BioIVT with 0.78%, Gentronix Limited with 0.46%, VITROCELL Systems GmbH with 0.32%, Promega Corporation with 0.31%, SGS SA with 0.29% and Hurel Corporation with 0.27%.

Market-trend-based strategies for the non-animal alternatives testing include focus on advancing OOC technology to develop more advanced organ-on-chips testing methods, focus on developing advanced human-patient simulators to lead the market, developing advanced 3D bioprinted organs and tissues to meet the needs of end-users, collaborations to expand and improve their manufacturing and portfolio of non-animal alternatives testing, investments to boost innovations in non-animal alternatives testing, and developing testing methods for the cosmetics industry to capitalize on increasing demand from the cosmetics industry.

Player-adopted strategies in the non-animal alternatives testing market includes strategic collaboration and acquisitions for research & development activities, investments, strategic partnerships for production new non-animal alternatives testing, establishment of new manufacturing facilities, and new product launches to meet the global demand.

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Report Structure



Introduction and Market Characteristics

Brief introduction to the segmentations covered in the market, definitions and explanations about non-animal alternatives testing market.



Global Market Size and Growth

Global forecast (2020-2025), and (2025-2030) market values, and drivers and restraints that support and control the growth of the market in the forecast periods.



Key Trends

Highlights the major trends shaping the global non-animal alternatives testing market. This section also highlights likely future developments in the market.



Competitive Landscape

Details on the competitive landscape of the market, estimated market shares and company profiles of the leading players.



Appendix

This section includes details on the NAICS codes covered, abbreviations and currencies codes used in this report.

Introduction And Market Characteristics

This global market report covers three, five-year time frames:

- 2015 – 2020: historic period
- 2020 – 2025: forecast period
- 2025 – 2030: forecast period

The report evaluates the market across regions and the major economies within each region.

The geographic regions used for the market analysis are as follows



Figure 1: Geographic Regions Covered

Summary

Data Type	Global	Regions
Forecast (2020-2030)	✓	✓
Segmentation By Technology		✓
Segmentation By End User		✓
Market Share	✓	

Market Definition

The non-animal alternatives testing market consists of sales of non-animal alternatives testing products and services that do not involve testing on animals to determine the safety and efficacy of products and ingredients used in any industry sector. Non-animal alternative testing technologies include: in-vitro human cell and tissue cultures, organs-on-chips (OOCs), computer simulations and modelling (silico models), 3D bio-printing of tissues, and synthetic skin substitutes as well as studies with human volunteers.ⁱ These technologies replace animal testing in end-use industries including pharmaceuticals, medical devices, chemicals & pesticides, food, and others.

Non-animal alternatives testing/animal replacement can be simply defined as any scientific method employing non-sentient material which may replace the use of conscious living vertebrates in animal experimentation.ⁱⁱ

Experiments on animals are cruel, time-consuming, and increasingly unacceptable to scientists and end consumers, therefore, scientists are developing and using animal-free methods. Non-animal methods are not hindered by species' differences that make applying animal test results to humans difficult or impossible. They also usually take less time to complete and are better able to predict how chemicals will react in the human body.^{iiiv}

The market by value in this report is defined as the revenues that enterprises gain from goods and/or services within the specified market and geography. It does not include revenues from resales either further along the supply chain or as part of other products. Only goods and services traded between entities or sold to end consumers are included. Whether specifically stated or not, the markets for goods include related services, and the markets for services include related goods.

The revenues for specified geography are consumption values – that is, they are revenues generated by organizations in the specified geography within the specified market, irrespective of where they are produced. Value is defined as the revenues generated from goods or services in a given geographic market through sales, grants, or donations in terms of currency (in \$ (\$) unless otherwise specified).

The non-animal testing market covered in this report is segmented by technology into cell culture, high throughput, molecular imaging, omics and other technologies. The market is also segmented by method into the cellular assay, biochemical assay, in silico, and ex-vivo and by end-users into the pharmaceutical industry, cosmetics and household products, diagnostics, chemicals industry, a food & beverage industry and others.

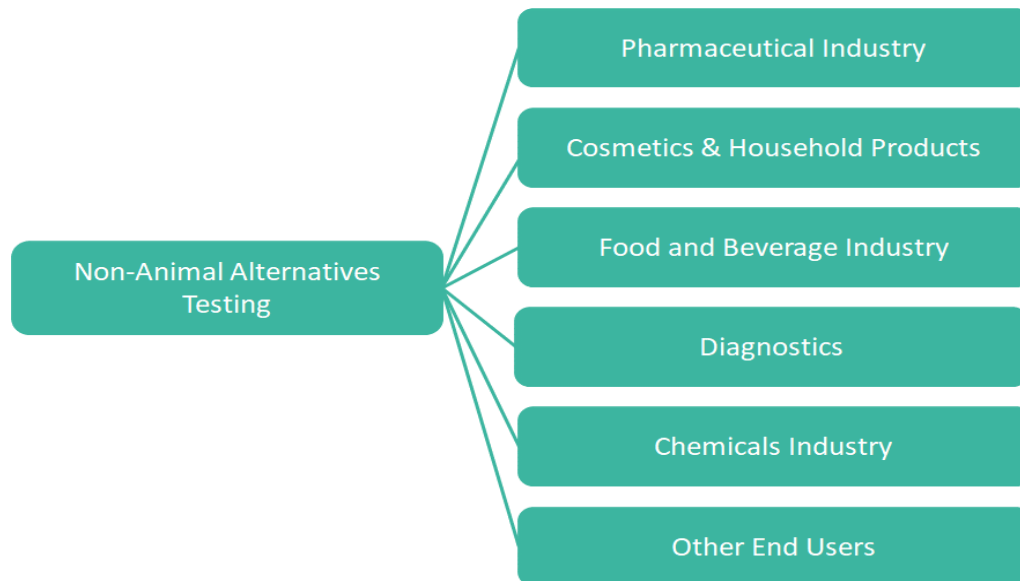
The market covered in this report includes sales of non-animal testing services by CROs (contract research organization) to end-use industries. The market is inclusive of the costs of alternate technology tools and other operational costs involved in using these tools for various pre-clinical testing purposes. The market takes into account the testing performed in alternative technologies in a particular geography i.e., where the testing happens, irrespective of where the products (drug or chemicals) that need to be tested are produced.

The market covered in this report excludes revenues generated from sales of animal testing products and services or any testing that includes animal use.

Segmentation By End-User

The non-animal alternatives testing market is also segmented by end-user into the pharmaceutical industry, cosmetics and household products, diagnostics, chemicals industry, food & beverage industry and other end users.

Figure 2: Global Non-Animal Alternatives Testing Market Segmentation By End User



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Sources: [TBRC Analysis](#)

Pharmaceutical Industry

The pharmaceutical industry market in the non-animal alternatives testing market consists of sales of non-animal alternatives testing services by entities (organizations, sole traders, and partnerships) that are used for testing pharmaceutical drugs. Non-animal alternatives testing is used in the pharmaceutical industry for a number of reasons and can also be cheaper and faster.^v

Cosmetics & Household Products

The cosmetics & household products market in the non-animal alternatives testing market consists of sales of non-animal alternatives testing services by entities (organizations, sole traders, and partnerships) that are used for testing cosmetics and household products. Non-animal alternatives testing is used in cosmetics and household products to reduce reliance on experimental testing, to test the efficacy of products and to meet ever increasing consumer expectations.^{vi}

Diagnostics

The diagnostics market in the non-animal alternatives testing market consists of sales of non-animal alternatives testing services by entities (organizations, sole traders, and partnerships) that are used for testing in the diagnostics. Non-animal alternatives testing is used in diagnostics to provide information about a disease and its prevention, diagnosis, and treatment.^{vii}

Chemicals Industry

The chemicals industry market in the non-animal alternatives testing market consists of sales of non-animal alternatives testing services by entities (organizations, sole traders, and partnerships) that are used for testing in the chemicals industry. Non-animal alternatives testing is used in the chemical industry for chemical safety assessment of industrial chemicals, chemicals in consumer products, pesticides, and biocides.^{viii}

Food & Beverage Industry

The food industry market in the non-animal alternatives testing market consists of sales of non-animal alternatives testing services by entities (organizations, sole traders, and partnerships) that are used for testing in the food & beverage industry. Non-animal alternatives testing is used in the food & beverage industry to mimic the actions of cells, organs, and the digestive system to ensure products are safe for human use and consumption and also to reduce testing time in food & beverage research.^{ix}

Other End Users

The other end users market consists of sales of non-animal alternatives testing services to industries other than the pharmaceutical industry, cosmetics and household products, diagnostics, chemicals industry, and food & beverage industry. The market includes sales of non-animal alternatives testing services to end-users like universities, medical schools, defense establishments, and commercial facilities that provide animal-testing services.

Major Market Trends

Major trends shaping the non-animal alternatives testing market include the following:

Development In OOCs (organs-on-chips) Tool For Testing

OOCs (organs-on-chips) tool for testing is a major trend in the non-animal alternatives testing market. Organs-on-a-chips (OOCs) are miniature tissues and organs grown in-vitro that enable the modeling of human physiology and disease. OOCs are now being explored worldwide as tools for developing disease models and accurately predicting drug efficacies and toxicities. The advantages of OOCs over cell culture, animal models, and human clinical trials have captured the attention of both the medical and pharmaceutical communities focusing on developing targeted therapies. For instance, in April 2020, researchers at the Massachusetts Institute of Technology (MIT) in the US, developed a new model for Organs-on-a-Chip to develop treatments for inflammatory diseases and afflictions.^x Organs-on-a-chip consists of millions of cells formed on a platform to replicate the functions of different organs and can be used as an instrument in analyzing and creating new treatments for complex diseases without the use of animals for testing.

Non-animal alternatives testing companies should consider advancing OOC technology to develop more advanced organ-on-chips testing methods.

Growing Collaborations For Non-Animal Alternatives Testing

Industry collaborations are also vital in the non-animal alternatives testing market. End-use industries including cosmetics, pharmaceutical, medical devices, chemicals, and food companies are increasingly seeking partnerships and collaborations with the organizations involved in developing non-animal alternative testing technologies.^{xi} Industry collaborations with leading scientists, academic research institutions, government agencies, and non-profit organizations help them better understand the industry requirements and bottlenecks in the deployment of these alternative technologies.^{xii} For instance, In October 2020, Emulate, Inc., a US-based company offering organs-on-chips technology, signed the Cooperative Research and Development Agreement (CRADA) with the US Food and Drug Administration (FDA) to evaluate the Lung-Chip used to determine the safety of COVID-19 vaccines and protective immunity against the virus.^{xiii} Also, in June 2019, the Estée Lauder Companies, a US-based makeup company expanded its partnership with Cruelty-Free International and Humane Society International to end animal testing in cosmetics.^{xiv}

Companies involved in non-animal testing should consider collaborations to expand and improve their manufacturing and portfolio of non-animal alternatives testing.

Adoption Of Human Patient Simulators For Testing

The use of human-patient simulators for testing is another major trend in the non-animal alternatives testing market. Such human-patient simulators are life-size adult and infant patient simulators that replicate elements of human physiology and can 'breathe', 'talk', 'bleed', 'convulse', and even 'die'. They have been shown to be a more effective method of teaching students physiology and pharmacology compared with crude exercises that involve cutting up animals. Many medical schools across the USA, Canada, and India have replaced the use of animal laboratories with simulators as well as computer simulators, virtual reality systems, and supervised clinical experience in medical training.^{xv} In January 2019, Simulab Launched new AirwayMan simulator, a new complete airway management training system to practice and train for complete airway management from nasal and oral intubation to needle and surgical cricothyroidotomy^{xvi}

Non-animal alternatives testing companies should focus on developing advanced human-patient simulators to lead the market.

Focus On Development Of 3D-Printed Organs For Testing

The use of 3D-printed organs is another important trend in the non-animal alternatives testing market. 3D-printed organs involve a fusion between tissue engineering and 3D printing. The 3D-printing techniques are used to create tissue-like structures from biomaterials and cells which are then cultured in a microfluidic system.^{xvii} These have the potential to test drugs on human tissues grown in 3D structures bioprinted with materials compatible with the in-vitro conditions. With these organs, the researchers can test drugs and therapies in the human body without animal testing. For instance, the Wake Forest Institute for Regenerative Medicine's researchers constructed miniature lungs and colons using 3D printers to create pinhead-sized replicas of human organs to test drugs for COVID-19.^{xviii}

Non-animal alternatives testing companies should focus on developing advanced 3D bioprinted organs and tissues to meet the needs of end-users.

Investments And Initiatives For Non-Animal Alternatives Testing

Investments and research grants for developing alternative technologies are increasingly important in the non-animal alternatives testing market. Many government agencies are supporting the research and development of cutting-edge non-animal alternative technologies through the provision of grants and investments to researchers and small businesses.^{xix} This helps researchers interrogate and develop more alternative methods thereby increasing the penetration of alternative technologies. For instance, in 2019, the US Environmental Protection Agency (EPA) awarded \$4.25 million in grants to universities for such research.^{xx} The US EPA also signed a directive that commits it to reduce its funding for animal studies by 30% by 2025, and to eliminate them entirely by 2035.^{xxi} In December 2020, the US Food and Drug Administration (FDA) launched Innovative Science and Technology Approaches for New Drugs (ISTAND), a pilot program that will help reduce and replace animal testing as part of drug development.^{xxii}

Companies involved in non-animal testing should get investments to boost innovations in non-animal alternatives testing.

Non-Animal Testing Methods In The Cosmetics Industry

The use of non-animal testing methods in the cosmetics industry is a key trend in the non-animal alternatives testing market. In the USA, Europe, Japan, and other countries, animal testing regulations for issues such as skin irritation, eye irritation, and skin sensitization are being replaced with OECD (Organization for Economic Co-operation and Development) test guidelines for cosmetics. For instance, the animal test for skin irritation has been replaced with in-vitro reconstructed Human Epidermis (RHE) test methods. The eye irritation test and skin sensitization tests are replaced with a reconstructed human cornea-like epithelium in-vitro (ARE-Nrf2 Luciferase) test method.^{xxiii} In addition to these, there are other alternatives to animal testing for cosmetics. For example, L'Oréal developed two alternative techniques for testing cosmetics.^{xxiv} The two methods are U-SENS and Human Corneal Epithelium Eye Irritation Test (HCE EIT). U-SENS is a technique designed to detect and predict skin allergies, which occur as a delayed immunological reaction upon repeated contact with a sensitizing substance whereas HCE EIT is a technique developed to assess the potential for eye irritation by chemicals.^{xxv} A ban on animal testing in the EU, and the lack of mandatory animal testing requirement in the USA for cosmetics has made it widely possible to use non-animal alternative testing methods for cosmetics.

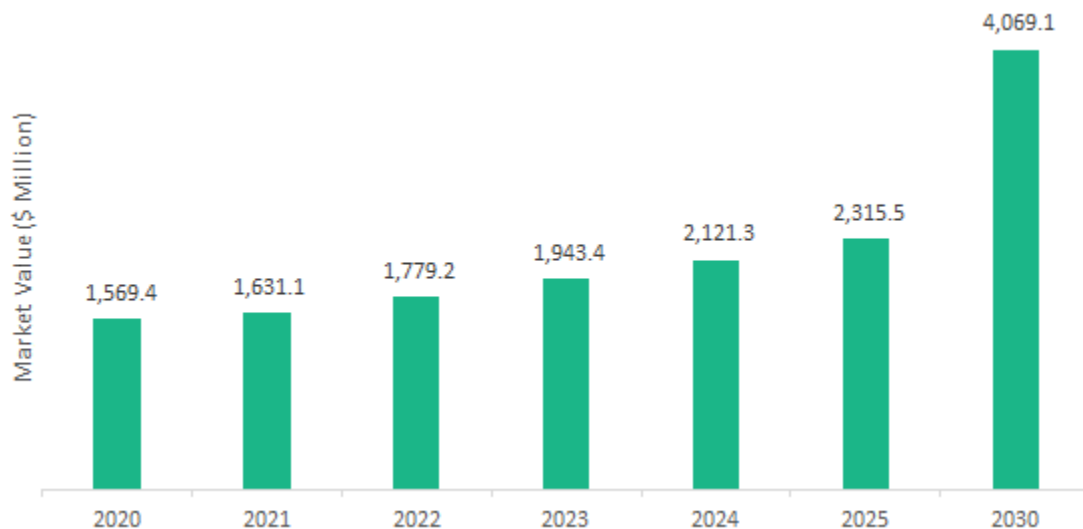
Non-animal alternatives testing companies should focus on developing testing methods for the cosmetics industry to capitalize on increasing demand from the cosmetics industry.

Global Market Size and Growth

Forecast Market Growth, 2020 – 2025, 2030F Value (\$ Million)

The chart and table below show the year-on-year growth of the global non-animal alternatives testing forecast market during 2020 – 2025, 2030F.

Figure 3: Global Non-Animal Alternatives Testing Market, Forecast, 2020 – 2025, 2030F, \$ Million



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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Table 1: Global Non-Animal Alternatives Testing Market, Forecast, 2020 – 2025, 2030F, \$ Million

Market	2020	2021	2022	2023	2024	2025	2030	CAGR (2020 – 2025)	CAGR (2025 – 2030)
Non-Animal Alternatives Testing	1,569.4	1,631.1	1,779.2	1,943.4	2,121.3	2,315.5	4,069.1	8.1%	11.9%

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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

The Global non-animal alternatives testing market is expected to grow from \$1,569.4 million in 2020 to \$2,315.5 million in 2025 at a compound annual growth rate (CAGR) of 8.1%. The market is expected to grow to \$4,069.1 million in 2030 at a compound annual growth rate (CAGR) of 11.9%. The growth in the forecast period can be attributed to increasing demand for personalized medication, entry of new advanced models of non-animal alternatives testing devices, increasing need for early detection of drug toxicity, and technological advancements in the market. In addition to this the rising aging population and need for therapies, Covid-19 pandemic, ongoing vaccine developments and responding to new variants will also support the market growth in future. For example, in 2021, according to Zhang et al., they had created an organ system-on-chip that is leading the integrated sensor on-chip technology through its sophisticated setup and capabilities. This platform effectively

developed integrated organ-on-chip models with multisensory systems, allowing for further advances in drug screening and organ-on-chip model use.^{xxvixxvii}

Drivers Of The Market 2020 – 2025

The key drivers of the non-animal alternatives testing market during 2020-2025 are expected to include:

Rise In Healthcare Expenditure

Increasing healthcare expenditure is predicted to drive the demand for the non-animal alternatives testing market. The growth in healthcare expenditure is aiding governments and organizations to spend more on prescription drugs, hospitals, and physical and clinical services, thereby driving the non-animal alternatives testing market. According to the National Health Expenditure Projections 2018-2027 of US, the national healthcare expenditure is expected to reach nearly \$6.0 trillion by 2027, growing at an average rate of 5.5% annually from 2018 to 2027. Furthermore, prescription drug spending is projected to grow by 6.1% annually during 2020-2027.^{xxviii} Consequently, the rise in healthcare spending is to increase the market for non-animal alternatives testing in the near future.

Ethical Concerns On Animal Experimentations

Alternative animal testing technologies are increasingly adopted by the end-use industries due to the pressure from animal rights organizations such as PETA (People for the Ethical Treatment of Animals), and Cruelty-Free International to treat animals ethically. These animal rights' organizations are protesting and conducting media campaigns to stop animal physiological distress and suffering use to testing for research on drugs, cosmetic products, chemicals, and food ingredients. These organizations are working closely with government agencies, educational institutions, and end-use industries to provide funding for developing alternative technologies. Therefore, ethical concerns on animal experiments are creating new legislation in various countries thereby driving the alternative technologies market.^{xxix}

Rise In The Number Of Research And Development Activities

The progress in science (that is the growing number of biological, pathological and research studies) leads to developments in alternative testing. As part of the effort to discover new medicines, researchers are constantly seeking ways to improve their research methodology to improve efficiency and results and deliver new and better therapies. This means that major investments are also made in the development of alternative methods that refine, replace, and reduce animal testing research as part of the scientific process. This widely supported strategy of reduction, refinement, and replacement is frequently referred to as the "3Rs" approach.^{xxx}

Restraints On The Market 2020 – 2025

The key restraints on the non-animal alternatives testing market during 2020-2025 are expected to include:

Stringent Regulatory Guidelines

Stringent regulations related to safety, efficacy, and quality are projected to act as a major challenge for players operating in the non-animal alternatives testing market. All medicines and treatments go through stringent testing in the lab (pre-clinical research) and in small groups of patients (clinical research). The European Medicines Agency (EMA) and The US (FDA) are the two main bodies regulating these novel therapies while getting them to market. Health Canada uses mAb specific guidelines from EMA or USFDA when necessary. The SAHPRA (South African Health Products Authority) biosimilar guideline has an annex on mAbs which focuses on non-clinical and clinical aspects. The Russian Federation has issued general product registration guideline/s with very brief information about mAbs.^{xxxi} Since it is a time-consuming process, it is considered as one of the major hindering factors for the non-animal alternatives testing market.

Western Europe Non-Animal Alternatives Testing Market

Western Europe Non-Animal Alternatives Testing Market Overview

This market overview describes and analyzes the region and market information, background information, government initiatives, regulations, regulatory bodies, major associations, investments, taxes, and major companies in Western Europe's non-animal alternatives testing market.

Region Information

The current population of Western Europe is 423.2 million. It is equivalent to 5.5% of the total world population in 2020. The projected GDP growth rate for Western Europe is 5.9% during 2020-2025. Major countries in Western Europe include the UK, Germany, France, Spain, and Italy.

Market Information

Western Europe was the third largest region in the non-animal alternatives testing market and was worth \$295.7 million in 2020. The market accounted for 0.002% of the region's GDP. In terms of per capita consumption, the market accounted for \$0.7, \$0.5 higher than the global average.

The non-animal alternatives testing market in Western Europe is supported by increasing demand for personalized medicine, growing need to minimize financial losses due to late-stage drug failure, rising adoption of in-vitro cell and tissue cultures, organs-on-chips (OOCs), computer simulations, 3D bioprinting of tissues, and synthetic skin substitutes technology by pharmaceutical, cosmetics, food and chemical industries and rising healthcare expenditure in the region. For instance, as of 2020, France, Germany, Italy, Spain had \$257.09 billion, \$399.34 billion, \$134.46 billion, \$92.15 billion public healthcare expenditure as compared to \$207.24 billion, \$316.12 billion, \$121.29 billion, \$77.82 billion in 2015.^{xxxii}

Background Information

Growth in per capita GDP in Western Europe has a positive impact on the non-animal alternatives testing market.

The table below shows the per capita GDP of the major countries in Western Europe during 2015-2020.

Table 2: Western Europe GDP Per Capita, 2015-2020, \$

Country	2015	2016	2017	2018	2019	2020	HCAGR (2015-2020)
France	37,937.76	38,348.38	40,134.21	43,083.32	41,896.55	39,257.32	0.69%
Germany	41,107.23	42,124.32	44,537.10	47,832.06	46,472.63	45,466.12	2.04%
Italy	30,212.91	30,932.55	32,367.33	34,500.20	33,158.81	30,657.06	0.29%
Spain	25,764.30	26,564.65	28,272.91	30,579.32	29,993.33	26,831.80	0.82%
Sweden	51,274.39	51,591.30	53,460.38	54,296.68	51,402.40	50,338.15	-0.37%
Switzerland	82,513.60	80,628.44	80,764.96	83,158.30	82,483.91	81,862.84	-0.16%
UK	44,989.06	41,193.64	40,406.62	43,114.25	42,378.61	39,228.25	-2.70%

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Sources: IMF^{xxxiii}, GMM^{xxxiv}, TBRC Secondary, TBRC Analysis, TBRC Estimates

Population By Age Group

The aging population is prone to several diseases. The growth in the aging population and rising need to develop new therapies and drugs in Western Europe has a positive impact on the non-animal alternatives testing market.

The table below shows the population by age group in the major countries in Western Europe during 2015-2025, in thousands.

Table 3: Western Europe, Population By Age Group, By Country, 2015-2025, Thousands

Country	Age Group	2015	2016	2017	2018	2019	2020	2025	HCAGR (2015-2020)	FCAGR (2020-2025)	Share
France	0-14	12,163	12,151	12,137	12,118	12,091	12,073	11,893	-0.15%	-0.30%	17.79%
	15-64	41,818	41,774	41,747	41,732	41,733	41,712	41,775	-0.05%	0.03%	61.45%
	65 +	12,612	12,935	13,235	13,511	13,781	14,090	15,450	2.24%	1.86%	20.76%
Germany	0-14	10,716	10,779	10,812	10,803	10,807	10,830	11,004	0.21%	0.32%	13.09%
	15-64	53,720	54,054	54,142	53,905	53,630	53,609	51,758	-0.04%	-0.70%	64.81%
	65 +	17,250	17,515	17,741	17,895	18,065	18,275	19,513	1.16%	1.32%	22.09%
Italy	0-14	8,336	8,250	8,185	8,130	8,065	7,999	7,580	-0.82%	-1.07%	13.24%

	15-64	38,813	38,609	38,427	38,273	38,120	37,948	37,121	-0.45%	-0.44%	62.82%
	65 +	13,581	13,768	13,940	14,107	14,278	14,458	15,438	1.26%	1.32%	23.93%
Spain	0-14	6,924	6,869	6,840	6,801	6,738	6,692	6,130	-0.68%	-1.74%	14.35%
	15-64	30,753	30,705	30,680	30,602	30,527	30,472	30,003	-0.18%	-0.31%	65.34%
	65 +	8,768	8,910	9,052	9,181	9,329	9,475	10,456	1.56%	1.99%	20.31%
Sweden	0-14	1,695	1,727	1,765	1,790	1,811	1,841	1,918	1.67%	0.82%	17.85%
	15-64	6,184	6,228	6,290	6,311	6,336	6,375	6,510	0.61%	0.42%	61.81%
	65 +	1,920	1,968	2,012	2,036	2,061	2,098	2,250	1.78%	1.41%	20.34%
Switzerland	0-14	1,225	1,241	1,259	1,273	1,287	1,303	1,368	1.25%	0.98%	15.01%
	15-64	5,567	5,605	5,646	5,670	5,691	5,722	5,768	0.55%	0.16%	65.92%
	65 +	1,491	1,527	1,561	1,590	1,621	1,655	1,854	2.12%	2.29%	19.07%
UK	0-14	11,453	11,557	11,693	11,836	11,958	12,088	12,350	1.09%	0.43%	17.99%
	15-64	41,874	42,001	42,103	42,175	42,260	42,357	42,825	0.23%	0.22%	63.04%
	65 +	11,802	12,037	12,225	12,382	12,547	12,740	13,793	1.54%	1.60%	18.96%

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Sources: IMF^{xxxv}, TBRC Secondary, TBRC Estimates, TBRC Analysis

Healthcare expenditure

Public Healthcare Expenditure

The table below shows the public healthcare expenditure in the major countries in Western Europe during 2015-2020.

Country	2015	2016	2017	2018	2019	2020	HCAGR (2015-2020)
France	207.24	228.26	238.02	253.73	245.33	257.09	4.41%
Germany	316.12	328.51	352.52	383.07	381.27	399.34	4.78%
Italy	121.29	121.92	125.67	133.71	128.51	134.46	2.08%
Spain	77.82	78.83	82.62	89.21	87.93	92.15	3.44%
Sweden	46.12	47.60	49.88	51.81	49.77	52.22	2.51%
Switzerland	50.98	51.20	53.10	53.71	58.17	60.81	3.59%
UK	230.71	212.70	206.36	222.47	226.07	236.74	0.52%

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Sources: World Bank^{xxxvi}, TBRC Analysis, TBRC Estimates

Private Healthcare Expenditure

The table below shows the private healthcare expenditure in the major countries in Western Europe during 2015-2020.

Table 5: Western Europe Private Healthcare Expenditure, 2015-2020, \$ Billion

Country	2015	2016	2017	2018	2019	2020	HCAGR (2015-2020)
France	63.18	46.53	47.83	49.66	46.01	47.44	-5.57%
Germany	59.44	61.14	64.56	69.95	67.34	69.38	3.14%
Italy	41.66	41.95	44.77	47.25	44.81	46.17	2.08%
Spain	31.30	31.34	34.32	37.50	36.70	37.87	3.89%
Sweden	8.73	8.79	8.97	9.08	8.63	8.90	0.37%
Switzerland	25.99	27.01	27.51	29.71	32.01	32.93	4.85%
UK	59.48	54.32	55.87	63.56	64.60	66.59	2.28%

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Sources: World Bank^{xxviii}, TBRC Analysis, TBRC Estimates

Pharmaceuticals Industry Market Size

Growth in the pharmaceuticals industry market size in Western Europe has a positive impact on the non-animal alternatives testing market.

The table below shows the market size of the pharmaceuticals industry in the major countries in Western Europe during 2015-2025, in billions.

Table 6: Western Europe, Pharmaceuticals Industry Market Size, By Country, 2015-2025, \$ Billion

Country	2015	2016	2017	2018	2019	2020	2025	HCAGR (2015-2020)	FCAGR (2020-2025)
France	29.68	30.68	31.72	32.80	34.29	34.93	45.25	3.3%	5.3%
Germany	36.24	37.05	38.04	39.70	41.24	41.51	52.70	2.8%	4.9%
Italy	22.66	23.02	22.28	21.99	22.45	22.69	28.58	0.0%	4.7%
Spain	14.41	14.97	15.41	15.76	16.53	16.17	22.32	2.3%	6.7%
Sweden	4.11	4.37	4.58	5.05	5.37	5.49	7.80	5.9%	7.3%
Switzerland	6.11	6.45	6.77	7.06	7.47	7.63	9.89	4.5%	5.3%
UK	22.14	23.64	24.81	25.48	26.64	27.23	38.39	4.2%	7.1%

The Business Research Company
Sources: TBRC Analysis, TBRC Estimates, TBRC Secondary

Chemicals Industry Market Size

Growth in the chemicals industry market size in Western Europe has a positive impact on the non-animal alternatives testing market.

The table below shows the market size of the chemicals industry in the major countries in Western Europe during 2015-2025, in billions.

Table 7: Western Europe, Chemicals Industry Market Size, By Country, 2015-2025, \$ Billion

Country	2015	2016	2017	2018	2019	2020	2025	HCAGR (2015-2020)	FCAGR (2020-2025)
France	69.73	68.33	71.74	66.50	65.61	56.64	67.98	-4.07%	3.72%
Germany	137.50	129.16	142.22	144.58	146.37	128.18	160.99	-1.39%	4.66%
Italy	66.63	62.29	64.03	62.91	62.40	53.32	64.76	-4.36%	3.96%
Spain	43.90	43.03	51.80	51.37	53.05	44.98	58.20	0.49%	5.29%
Sweden	15.65	14.65	14.15	13.86	13.53	11.85	14.46	-5.40%	4.06%
Switzerland	33.89	32.96	31.28	29.52	28.02	24.78	24.24	-6.07%	-0.44%
UK	46.55	50.50	54.04	53.55	52.97	45.72	56.06	-0.36%	4.16%

The Business Research Company
Sources: [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Government Initiatives

On July 6, 2007, the French government established FRANCOPA, the French platform for the development, validation, and dissemination of alternative methods to animal testing which aims to promote methods to reduce animal suffering, to use a bioinformatics method, a cell test in place of a test on animals, or to reduce the number of animals used during this test.^{xxxviii}

In March 2021, the Dutch Research Council (NWO) announced a grant of €3.4 million (\$4.0 million) for the organs-on-chips that the hDMT consortium plans to develop that will eventually enable a significant reduction in animal testing. hDMT is a collaboration of various research groups, companies and knowledge institutes of which is the Stichting Proefdiervrij (Dutch Society for the Replacement of Animal Testing).^{xi}

The hDMT consortium will develop a universal standard for OOCs and its goal is to link several organ-on-chips together in order to simulate a complete body. The consortium is also investing €1.4 million in the project.

In March 2021, Innovate UK, the UK government innovation agency, announced an undisclosed grant for CN Bio, a UK developer of organ-on-chip, for the development of single and multi-organ-on-chip models for COVID-19 research. The grant will fund the developing and testing advanced cell culture models that represent different regions of the lung and subsequently linking these models to other organ systems, such as liver and gut, to inform the rapid development of novel therapeutics.^{xli}

In January 2020, the European Commission awarded a European Union's Horizon 2020 research and innovation programme grant to the BIOFABICS, a Portuguese start-up company. The company intends to bridge the gap between biology and the technology, by enabling researchers to design and request their own highly customised OOC devices through a very straightforward online interface, called BIOFABICS TOOLBOX.^{xlii}

Regulations

In France, there is legislation that is animal welfare law, on animal studies which aims to reduce the number of studies and animals used for scientific purposes. It encourages the development of alternative methods and recourse to animal models only when no other methods are available for the study.^{xliii}

The German Animal Welfare Act falls in line with international legislative approaches concerning animals used in scientific research and recognizes animal welfare as a key individual issue to the industry. The act explicitly allows the use of animals in basic research; however, it must be proved that the goal of the experiments cannot be reached using other methods or techniques.^{xliv}

Animal research is strictly regulated in the UK. The use of animals in experiments and testing is regulated under the Animals (Scientific Procedures) Act 1986 (ASPA). ASPA has been revised to change the European Directive 2010/63/EU on the protection of animals used for scientific purposes, and the revised legislation came into force on 1 January 2013. The other regulatory unit is the Animals in Science Regulation Unit (ASRU).

In January 2021, the UK adopted a new cosmetics regulation (Product Safety and Metrology, etc. Regulations 2019, Schedule 34) that bans animal testing.^{xlv}

Regulatory Bodies

The French Ministry of Agriculture and Food^{xlvi}, The Ministry of Food and Agriculture, Germany^{xlvii}, The Ministry of Health, Germany^{xlviii}, Medicines and Healthcare Products Regulatory Agency (MHRA)^{xlix} (UK), and Accredia¹ (Italy) are the major regulatory bodies governing the Western Europe non-animal alternatives testing market.

Major Associations

ZEBET (Centre for Documentation and Evaluation of Alternative Methods to Animal Experiments), Germany, FRANCOPA (French platform for the development of alternative methods in animal testing), NC3Rs (National Centre for the Replacement, Reduction, and Refinement of Animals in Research), UK^{li} are the major association in the non-animal alternatives testing market in Western Europe.

Taxes Levied

The standard tax rate in the UK is 20%.^{lii}

Germany levies a standard VAT of 19% for all drugs.^{liii}

Spain levies standard VAT of 21%.^{liiv}

France levies a standard VAT of 20% on drugs.^{liv}

Italy levies a standard VAT of 22% on drugs.^{lvi}

Corporate Tax Structure

In the UK, the standard tax rate is around 19%^{clxix} and for small scale enterprises, it is 19.8%.^{lvii}

Corporate tax in France is 31% while 28% of tax on the first €500,000 (\$0.59 million) of taxable profit^{lviii}.

Corporate tax in Germany is 30-33%. The company tax rate is 15%, a municipal surcharge of between 14% and 17% depending on municipalities, and a solidarity surcharge of 5.5% levied on the corporate income tax.^{lix}

Investments

The UK organ-on-a-chip Network collaborated with Emulate, Inc. to offer Proof of Concept Award with £100k (\$139942.5) of funding and provides access to £120,000 (\$167847) of state-of-the-art organ-chip technology by utilizing a brand new core facility at Queen Mary University of London, The Queen Mary-Emulate Organs on Chips Centre.^{lx}

In May 2021, PerkinElmer, Inc. acquired Immunodiagnostic Systems Holdings PLC for approximately \$155 million (£110 Million). Through this acquisition, PerkinElmer will be able to grow its overall diagnostics business and specifically its immunodiagnosics segment.^{lxi}

In 2020, BioMérieux SA, a French multinational biotechnology company, formed a partnership with the Africa Medical Supplies Platform (AMSP), an online marketplace, for the supply of COVID-19-related critical diagnostics, and medical equipment and consumables in African Union Member States.^{lxii}

In 2019, Sense Biodetection Limited, a molecular diagnostics company, raised EUR 14 million (\$16.75 million) in a Series A financing round. The finance was provided by Cambridge Innovation Capital (CIC), Earlybird, Jonathan Milner, and Mercia Asset Management. The company intends to use the funds for the development of point-of-care molecular diagnostic tests.^{lxiii}

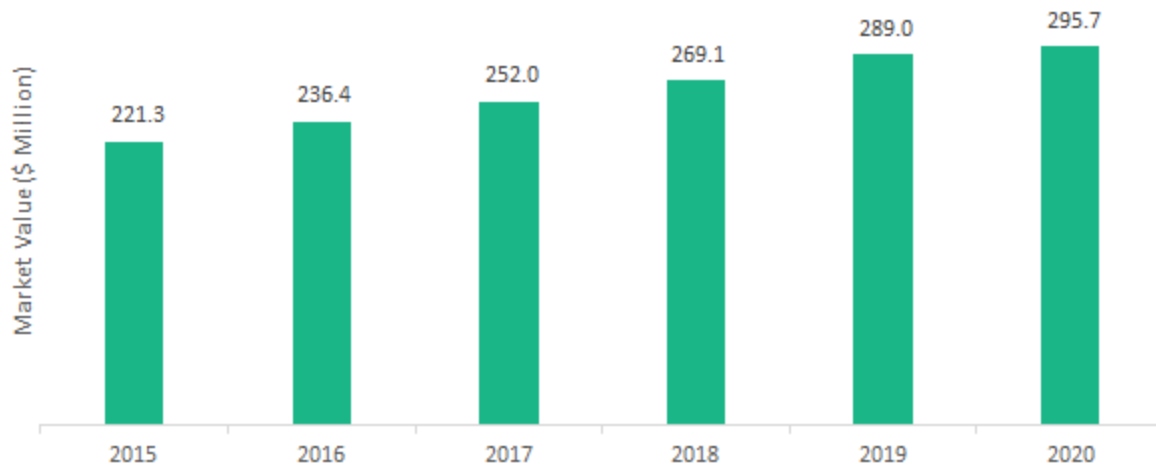
Major Companies

F. Hoffmann-La Roche AG^{lxiv}, Siemens Healthineers AG^{lxv}, Qiagen N.V.^{lxvi}, Biocartis Group NV^{lxvii}, bioMérieux SA^{lxviii} and QuantuMDx^{lxix} are the major companies in the non-animal alternatives testing market of Western Europe.

Western Europe Non-Animal Alternatives Testing Market, Historic Market Growth, 2015 – 2020, Value (\$ Million)

The chart and table below show the year-on-year growth of the Western Europe non-animal alternatives testing historic market during 2015 – 2020.

Figure 4: Western Europe Non-Animal Alternatives Testing Market, Historic, 2015 – 2020, \$ Million



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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Table 8: Western Europe Non-Animal Alternatives Testing Market, Historic, 2015 – 2020, \$ Million

Market	2015	2016	2017	2018	2019	2020	HCAGR (2015 – 2020)
Non-Animal Alternatives Testing	221.3	236.4	252.0	269.1	289.0	295.7	6.0%

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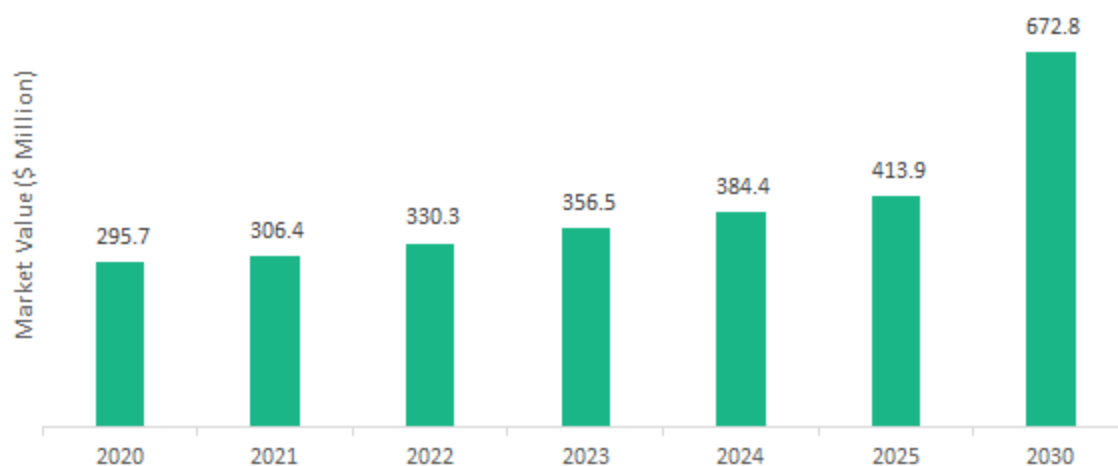
Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

The Western Europe non-animal alternatives testing market grew from \$221.3 million in 2015 to \$295.7 million in 2020 at a compound annual growth rate (CAGR) of 6.0%. The growth in the historic period can be attributed to the rising need for alternatives for animal testing, an increase in R&D funding for the development of non-animal alternative testing, a rising ban on animal testing, and substantial funding of public and private sources for in-vitro cell and tissue cultures, organs-on-chips (OOCs), computer simulations, 3D bioprinting of tissues, and synthetic skin substitutes start-ups and research groups.

Western Europe Non-Animal Alternatives Testing Market, Forecast Market Growth, 2020 – 2025, 2030F Value (\$ Million)

The chart and table below show the year-on-year growth of the Western Europe non-animal alternatives testing forecast market during 2020 – 2025, 2030F.

Figure 5: Western Europe Non-Animal Alternatives Testing Market, Forecast, 2020 – 2025, 2030F, \$ Million



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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Table 9: Western Europe Non-Animal Alternatives Testing Market, Forecast, 2020 – 2025, 2030F, \$ Million

Market	2020	2021	2022	2023	2024	2025	2030	CAGR (2020 – 2025)	CAGR (2025 – 2030)
Non-Animal Alternatives Testing	295.7	306.4	330.3	356.5	384.4	413.9	672.8	7.0%	10.2%

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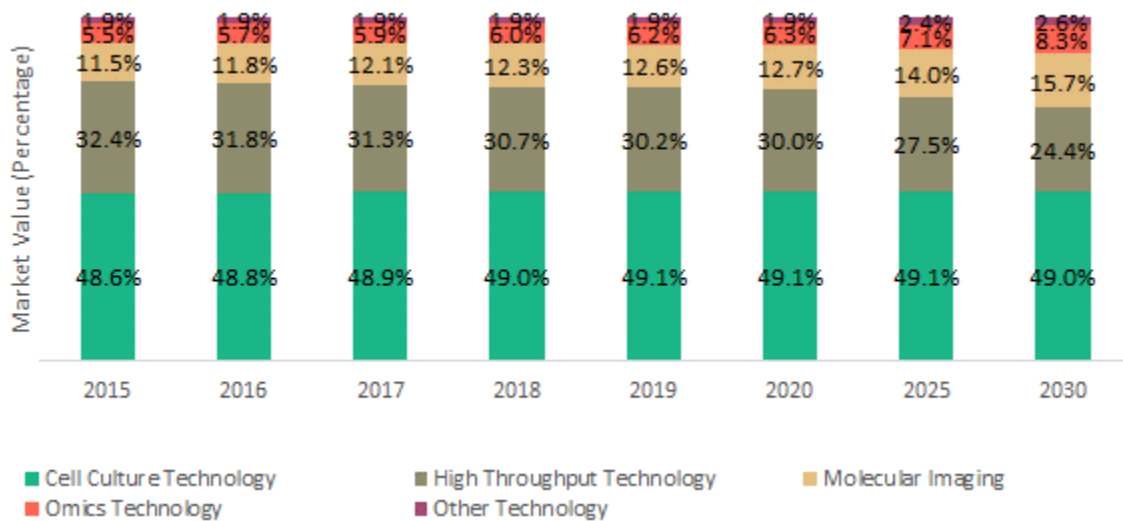
Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

The Western Europe non-animal alternatives testing market is expected to grow from \$295.7 million in 2020 to \$413.9 million in 2025 at a compound annual growth rate (CAGR) of 7.0%. The market is expected to grow to \$672.8 million in 2030 at a compound annual growth rate (CAGR) of 10.2%. The growth in the forecast period can be attributed to increasing demand for personalized medication, entry of new advanced models of non-animal alternatives testing devices, increasing need for early detection of drug toxicity, technological advancements in the market, and continues investment and adoption of in-vitro cell and tissue cultures, organs-on-chips (OOCs), computer simulations, 3D bioprinting of tissues, and synthetic skin substitutes technology by pharmaceutical, cosmetics, food, and chemical industries

Western Europe Non-Animal Alternatives Testing Market, Segmentation By Technology, Historic And Forecast, 2015 – 2020, 2025F, 2030F, Value (\$ Million)

The chart and table below show the year-on-year growth of the Western Europe non-animal alternatives testing market and its segments by technology during 2015 – 2020, 2025F, 2030F.

Figure 6: Western Europe Non-Animal Alternatives Testing Market, Segmentation By Technology, Historic And Forecast, 2015 – 2020, 2025F, 2030F, %



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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Table 10: Western Europe Non-Animal Alternatives Testing Market, Segmentation By Technology, Historic And Forecast, 2015 – 2020, 2025F, 2030F, %

Market	Year								CAGR		
	2015	2016	2017	2018	2019	2020	2025	2030	15-20	20-25	25-30
Cell Culture Technology	48.6%	48.8%	48.9%	49.0%	49.1%	49.1%	49.1%	49.0%	6.2%	7.0%	10.1%
High Throughput Technology	32.4%	31.8%	31.3%	30.7%	30.2%	30.0%	27.5%	24.4%	4.4%	5.1%	7.7%
Molecular Imaging	11.5%	11.8%	12.1%	12.3%	12.6%	12.7%	14.0%	15.7%	8.1%	9.0%	12.8%
Omics Technology	5.5%	5.7%	5.9%	6.0%	6.2%	6.3%	7.1%	8.3%	8.7%	9.6%	13.7%
Other Technology	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	2.4%	2.6%	5.8%	11.7%	12.2%
Non-Animal Alternatives Testing	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	6.0%	7.0%	10.2%

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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Table 11: Western Europe Non-Animal Alternatives Testing Market, Segmentation By Technology, Historic And Forecast, 2015 – 2020, 2025F, 2030F, \$ Million

Market	Year								CAGR		
	2015	2016	2017	2018	2019	2020	2025	2030	15-20	20-25	25-30
Cell Culture Technology	107.6	115.3	123.2	131.7	141.8	145.1	203.2	329.4	6.2%	7.0%	10.1%
High Throughput Technology	71.7	75.3	78.9	82.7	87.3	88.7	113.6	164.5	4.4%	5.1%	7.7%
Molecular Imaging	25.5	27.9	30.4	33.2	36.5	37.6	57.9	105.7	8.1%	9.0%	12.8%
Omics Technology	12.2	13.5	14.8	16.3	18.0	18.6	29.4	55.9	8.7%	9.6%	13.7%
Other Technology	4.3	4.5	4.8	5.1	5.5	5.6	9.8	17.4	5.8%	11.7%	12.2%
Non-Animal Alternatives Testing	221.3	236.4	252.0	269.1	289.0	295.7	413.9	672.8	6.0%	7.0%	10.2%

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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

The cell culture technology market was the largest segment in the Western Europe non-animal alternatives testing market. The market grew from \$107.6 million in 2015 to \$145.1 million in 2020 at a compound annual growth rate (CAGR) of 6.2%. The market is expected to grow to \$203.2 million in 2025 at a compound annual growth rate (CAGR) of 7.0%, and to \$329.4 million in 2030 at a compound annual growth rate of 10.1%.

The high throughput technology market was the second largest segment in the Western Europe non-animal alternatives testing market. The market grew from \$71.7 million in 2015 to \$88.7 million in 2020 at a compound annual growth rate (CAGR) of 4.4%. The market is expected to grow to \$113.6 million in 2025 at a compound annual growth rate (CAGR) of 5.1%, and to \$164.5 million in 2030 at a compound annual growth rate of 7.7%.

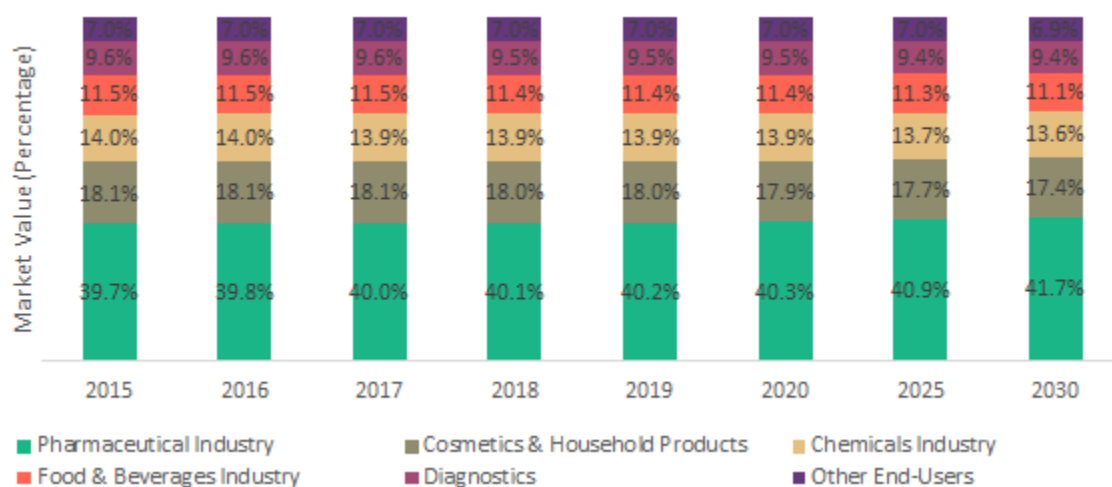
The other technology market was the smallest segment in the Western Europe non-animal alternatives testing market. The market grew from \$4.3 million in 2015 to \$5.6 million in 2020 at a compound annual growth rate (CAGR) of 5.8%. The market is expected to grow to \$9.8 million in 2025 at a compound annual growth rate (CAGR) of 11.7%, and to \$17.4 million in 2030 at a compound annual growth rate of 12.2%.

The Western Europe non-animal alternatives testing market grew from \$221.3 million in 2015 to \$295.7 million in 2020 at a compound annual growth rate (CAGR) of 6.0%. The market is expected to grow to \$413.9 million in 2025 at a compound annual growth rate (CAGR) of 7.0%, and to \$672.8 million in 2030 at a compound annual growth rate of 10.2%.

Western Europe Non-Animal Alternatives Testing Market, Segmentation By End Users, Historic And Forecast, 2015 – 2020, 2025F, 2030F, Value (\$ Million)

The chart and table below show the year-on-year growth of the Western Europe non-animal alternatives testing market and its segments by end users during 2015 – 2020, 2025F, 2030F.

Figure 7: Western Europe Non-Animal Alternatives Testing Market, Segmentation By End Users, Historic And Forecast, 2015 – 2020, 2025F, 2030F, %



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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Table 12: Western Europe Non-Animal Alternatives Testing Market, Segmentation By End Users, Historic And Forecast, 2015 – 2020, 2025F, 2030F, %

Market	Year								CAGR		
	2015	2016	2017	2018	2019	2020	2025	2030	15-20	20-25	25-30
Pharmaceutical Industry	39.7%	39.8%	40.0%	40.1%	40.2%	40.3%	40.9%	41.7%	6.3%	7.3%	10.6%
Cosmetics & Household Products	18.1%	18.1%	18.1%	18.0%	18.0%	17.9%	17.7%	17.4%	5.7%	6.7%	9.8%
Chemicals Industry	14.0%	14.0%	13.9%	13.9%	13.9%	13.9%	13.7%	13.6%	5.8%	6.8%	9.9%
Food & Beverages Industry	11.5%	11.5%	11.5%	11.4%	11.4%	11.4%	11.3%	11.1%	5.7%	6.7%	9.9%
Diagnostics	9.6%	9.6%	9.6%	9.5%	9.5%	9.5%	9.4%	9.4%	5.8%	6.8%	10.0%
Other End-Users	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	6.9%	5.9%	6.8%	10.0%
Non-Animal Alternatives Testing	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	6.0%	7.0%	10.2%

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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Table 13: Western Europe Non-Animal Alternatives Testing Market, Segmentation By End Users, Historic And Forecast, 2015 – 2020, 2025F, 2030F, \$ Million

Market	Year								CAGR		
	2015	2016	2017	2018	2019	2020	2025	2030	15-20	20-25	25-30
Pharmaceutical Industry	87.9	94.2	100.7	107.9	116.3	119.1	169.2	280.3	6.3%	7.3%	10.6%
Cosmetics & Household Products	40.2	42.8	45.5	48.5	51.9	53.1	73.3	117.3	5.7%	6.7%	9.8%
Chemicals Industry	30.9	33.0	35.1	37.4	40.1	41.0	56.9	91.3	5.8%	6.8%	9.9%
Food & Beverages Industry	25.5	27.2	28.9	30.8	33.0	33.7	46.6	74.6	5.7%	6.7%	9.9%
Diagnostics	21.3	22.7	24.1	25.7	27.5	28.1	39.1	63.0	5.8%	6.8%	10.0%
Other End-Users	15.6	16.6	17.7	18.9	20.3	20.7	28.8	46.4	5.9%	6.8%	10.0%
Non-Animal Alternatives Testing	221.3	236.4	252.0	269.1	289.0	295.7	413.9	672.8	6.0%	7.0%	10.2%

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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

The pharmaceutical industry market was the largest segment in the Western Europe non-animal alternatives testing market. The market grew from \$87.9 million in 2015 to \$119.1 million in 2020 at a compound annual growth rate (CAGR) of 6.3%. The market is expected to grow to \$169.2 million in 2025 at a compound annual growth rate (CAGR) of 7.3%, and to \$280.3 million in 2030 at a compound annual growth rate of 10.6%.

The cosmetics & household products market was the second largest segment in the Western Europe non-animal alternatives testing market. The market grew from \$40.2 million in 2015 to \$53.1 million in 2020 at a compound annual growth rate (CAGR) of 5.7%. The market is expected to grow to \$73.3 million in 2025 at a compound annual growth rate (CAGR) of 6.7%, and to \$117.3 million in 2030 at a compound annual growth rate of 9.8%.

The other end-users market was the smallest segment in the Western Europe non-animal alternatives testing market. The market grew from \$15.6 million in 2015 to \$20.7 million in 2020 at a compound annual growth rate (CAGR) of 5.9%. The market is expected to grow to \$28.8 million in 2025 at a compound annual growth rate (CAGR) of 6.8%, and to \$46.4 million in 2030 at a compound annual growth rate of 10.0%.

The Western Europe non-animal alternatives testing market grew from \$221.3 million in 2015 to \$295.7 million in 2020 at a compound annual growth rate (CAGR) of 6.0%. The market is expected to grow to \$413.9 million in 2025 at a compound annual growth rate (CAGR) of 7.0%, and to \$672.8 million in 2030 at a compound annual growth rate of 10.2%.

Eastern Europe Non-Animal Alternatives Testing Market

Eastern Europe Non-Animal Alternatives Testing Market Overview

This market overview describes and analyzes the region and market information, background information, government initiatives, regulations, regulatory bodies, major associations, investments, taxes, and major companies in the Eastern Europe non-animal alternatives testing market.

Region Information

Eastern Europe's total GDP was \$3.5 trillion in 2020, accounting for 4.2% of global GDP, according to the IMF. The region's GDP is expected to grow at a CAGR of 6.8% during 2020-2025. Eastern Europe had a population of around 337.9 million in 2020. In terms of GDP, Russia is the largest country in Eastern Europe, followed by Poland, Romania, the Czech Republic, and then the other countries.

Market Information

Eastern Europe was the fifth largest region in the non-animal alternatives testing market and was worth \$51.7 million in 2020. The market accounted for 0.001% of the region's GDP. In terms of per capita consumption, the market accounted for \$0.15, \$0.1 lower than the global average.

The non-animal alternatives testing market in Eastern Europe is supported by the rising need for alternatives for animal testing, demand for personalized medication, adoption of the 3R principle by regulatory agencies and end-user companies. Increasing adoption of alternative technologies especially in the cosmetic industry, government support, high adoption of technologies such as organs-on-chips (OOCs), in silico, and 3D cell culture in the pharmaceuticals and medical devices industries as an alternative to animal testing will also drive the non-animal alternative testing market.

Background Information

GDP Per Capita

Growth in per capita GDP in Eastern Europe has a positive impact on the non-animal alternatives testing market.

The table below shows the per capita GDP of the major countries in Eastern Europe during 2015-2020.

Country	2015	2016	2017	2018	2019	2020	HCAGR (2015-2020)
Czech Republic	17,843.33	18,596.93	20,666.32	23,459.85	23,538.12	22,627.17	4.87%
Poland	12,565.96	12,427.77	13,871.57	15,460.65	15,600.58	15,303.60	4.02%
Romania	8,950.24	9,538.74	10,776.62	12,371.41	12,887.19	12,813.03	7.44%
Russia	9,257.93	8,723.52	10,723.99	11,344.98	11,601.41	9,972.47	1.50%

The Business Research Company, Sources: IMF^{xxx}, GMM^{xxx}, TBRC Secondary, TBRC Analysis, TBRC Estimates

Population By Age Group

The aging population is prone to several diseases. The growth in the aging population and rising need to develop new therapies and drugs in Eastern Europe has a positive impact on the non-animal alternatives testing market.

The table below shows the population by age group in the major countries in Eastern Europe during 2015-2025, in thousands.

Table 15: Eastern Europe, Population By Age Group, By Country, 2015-2025, Thousands

Country	Age Group	2015	2016	2017	2018	2019	2020	2025	HCAGR (2015-2020)	FCAGR (2020-2025)	Share
Czech Republic	0-14	1,596	1,608	1,628	1,647	1,658	1,674	1,645	0.96%	-0.35%	15.75%
	15-64	7,053	7,000	6,948	6,889	6,840	6,788	6,663	-0.76%	-0.37%	63.88%
	65 +	1,898	1,958	2,015	2,064	2,108	2,164	2,329	2.66%	1.48%	20.37%
Poland	0-14	5,654	5,621	5,627	5,639	5,633	5,628	5,290	-0.09%	-1.23%	14.86%
	15-64	26,402	26,203	25,983	25,710	25,443	25,209	24,046	-0.92%	-0.94%	66.58%
	65 +	5,930	6,146	6,366	6,577	6,793	7,027	8,214	3.45%	3.17%	18.56%
Romania	0-14	3,055	3,017	2,990	2,968	2,943	2,916	2,748	-0.93%	-1.18%	15.15%
	15-64	13,392	13,254	13,101	12,942	12,791	12,645	12,007	-1.14%	-1.03%	65.69%
	65 +	3,369	3,432	3,496	3,561	3,623	3,690	3,992	1.84%	1.59%	19.17%
Russia	0-14	24,255	24,960	25,439	25,716	25,953	26,397	27,063	1.71%	0.50%	18.31%
	15-64	100,405	99,477	98,569	97,517	96,468	95,503	90,548	-1.00%	-1.06%	66.23%
	65 +	19,437	19,906	20,487	21,096	21,691	22,294	25,248	2.78%	2.52%	15.46%

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Sources: [IMF^{xxii}](#), [TBRC Secondary](#), [TBRC Estimates](#), [TBRC Analysis](#)

Healthcare expenditure

Healthcare expenditure includes the total expenditure on healthcare including the reimbursements offered by governmental and non-governmental organizations. Growth in healthcare expenditure in Eastern Europe has a positive impact on the market for non-animal alternatives testing.

Public Healthcare Expenditure

The table below shows the public healthcare expenditure in the major countries in Eastern Europe during 2015-2020.

Table 16: Eastern Europe Public Healthcare Expenditure, 2015-2020, \$ Billion

Country	2015	2016	2017	2018	2019	2020	HCAGR (2015-2020)
Czech Republic	11.15	11.43	12.17	15.53	15.94	16.67	8.39%
Poland	21.33	21.42	24.02	26.59	25.64	26.86	4.71%
Romania	0.88	0.96	1.05	1.15	1.25	1.31	8.38%
Russia	42.70	38.75	49.21	52.85	56.10	58.59	6.53%

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Sources: World Bank^{lxxxiii}, TBRC Analysis, TBRC Estimates

Private Healthcare Expenditure

The table below shows the private healthcare expenditure in the major countries in Eastern Europe during 2015-2020.

Table 17: Eastern Europe Private Healthcare Expenditure, 2015-2020, \$ Billion

Country	2015	2016	2017	2018	2019	2020	HCAGR (2015-2020)
Czech Republic	2.39	2.51	2.66	3.17	3.19	3.28	6.57%
Poland	9.25	9.48	10.65	10.60	10.82	11.14	3.79%
Romania	1.73	1.87	2.03	2.19	2.37	2.44	7.12%
Russia	30.02	29.29	36.99	36.04	38.68	39.84	5.82%

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Sources: World Bank^{lxxxiv}, TBRC Analysis, TBRC Estimates

Pharmaceuticals Industry Market Size

The table below shows the market size of the pharmaceuticals industry in the major countries in Eastern Europe during 2015-2025, in billions.

Table 18: Eastern Europe, Pharmaceuticals Industry Market Size, By Country, 2015-2025, \$ Billion

Country	2015	2016	2017	2018	2019	2020	2025	HCAGR (2015-2020)	FCAGR (2020-2025)
Czech Republic	3.08	3.21	3.40	3.53	3.87	3.96	5.19	5.1%	5.5%
Poland	5.21	5.41	5.62	5.83	6.23	6.27	8.94	3.8%	7.3%
Romania	1.81	1.88	1.95	2.03	2.10	2.13	2.73	3.3%	5.1%
Russia	13.74	14.11	14.50	14.91	15.94	15.55	20.95	2.5%	6.1%

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Sources: TBRC Analysis, TBRC Estimates, TBRC Secondary

Chemicals Industry Market Size

The table below shows the market size of the chemicals industry in the major countries in Eastern Europe during 2015-2025, in billions.

Table 19: Eastern Europe, Chemicals Industry Market Size, By Country, 2015-2025, \$ Billion

Country	2015	2016	2017	2018	2019	2020	2025	HCAGR (2015-2020)	FCAGR (2020-2025)
Czech Republic	13.42	13.99	17.91	16.66	17.85	15.37	19.70	2.74%	5.10%
Poland	24.80	24.04	26.01	27.41	28.27	24.65	35.48	-0.12%	7.55%
Romania	7.17	7.36	8.03	8.47	8.96	7.86	10.37	1.85%	5.71%
Russia	48.86	51.78	46.78	52.50	51.88	43.67	59.97	-2.22%	6.55%

The Business Research Company
Sources: [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Government Initiatives

Russia has banned animal testing for all cosmetic products and ingredients to contribute to the global effort by Cruelty Free International to end experiments of this kind and adopt modern non-animal alternatives.^{lxxv}

Regulations

In Poland, the Polish Animal Protection Act undertakes activities aimed at protecting animals. The act refers to using animals for scientific or educational purposes that may lead to bodily injuries or other health disorders, including pain, suffering, and fear, except for animal branding.^{lxxvi}

The EU Regulation on chemicals and their safe use - REACH (Registration, Evaluation, Authorization, and Restriction of Chemical substances) which came into force in 2007 has implications for the testing methods used for evaluating the effects of chemical substances. To minimize the number of animal tests required in implementing the REACH Regulation, provision has been made to provide several possibilities for adapting the testing requirements, and to use existing data and alternative assessment approaches instead.^{lxxvii}

Regulatory Bodies

The Ministry of Healthcare of the Russian Federation (Minzdrav)^{lxxviii} (Russia), Ministry of Health^{lxxix} (Poland), National Agency for Medicines and Medical Devices of Romania^{lxxx} (Romania), State Institute for Drug Control (SUKL)^{lxxxi} (Czech Republic), and the Ukrainian Ministry of Health Protection^{lxxxii} (Ukraine) are the major regulatory bodies governing the Eastern Europe non-animal alternatives testing market in Eastern Europe.

Major Associations

Rus-LASA (Russian Laboratory Animal Science Association), ARSAL (Asociatia Româna Pentru Stiinta Animalelor de Laboratory; Romanian Laboratory Animal Science Association), ROCAM (Romanian Center for Alternative Test Methods), CLASA (Czech Laboratory Animal Science Association), and HLASA (Hungarian Laboratory Animal Science Association)^{lxxxiii} are the major associations in Eastern Europe non-animal alternatives testing market.

Taxes Levied

As of January 2018, medical devices are charged with a VAT of 0% or 10% in Russia.^{lxxxiv}

In Poland, medical devices and in-vitro diagnostic medical devices are exempted from VAT until August 2020 to help fight against COVID-19.^{lxxxv}

Corporate Tax Structure

Russia corporate tax is within a limit of 20%.^{lxxxvi}

Poland's corporate tax is 19%.^{lxxxvii}

Ukraine's corporate tax is 18%.^{lxxxviii}

Romania's corporate tax is 16%.^{lxxxix}

Czech Republic corporate tax is 19%.^{xc}

Investments

In 2020, Thermo Fisher Scientific, a provider of analytical and other instruments, formed a strategic partnership with First Genetics JCS, a manufacturer of diagnostic equipment and IVD kits, for commercializing next-generation sequencing (NGS)-based diagnostics in Russia. The partnership will allow First Genetics to market its F-Genetics NGS System and IVD assays to Russian labs for cancer diagnostics and reproductive health testing.^{xc1}

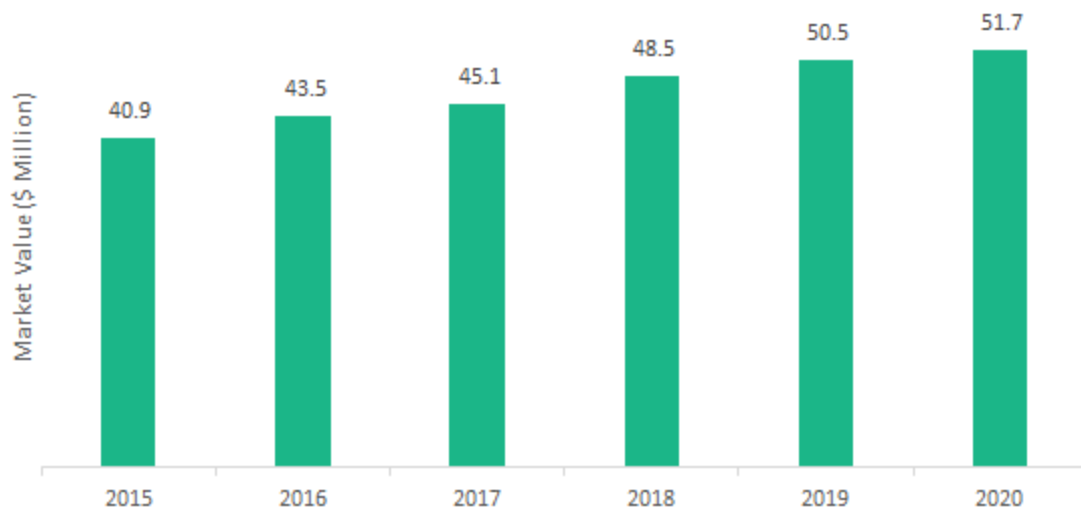
Major Companies

Interlabservis^{xcii}, Roche Diagnostics^{xciii}, GeneMe^{xciv}, Siemens Healthineers Ukraine^{xcv}, and TestLine Clinical Diagnostics s.r.o.^{xcvi} are the major companies in the non-animal alternatives testing market of Eastern Europe.

Eastern Europe Non-Animal Alternatives Testing Market, Historic Market Growth, 2015 – 2020, Value (\$ Million)

The chart and table below show the year-on-year growth of the Eastern Europe non-animal alternatives testing historic market during 2015 – 2020.

Figure 8: Eastern Europe Non-Animal Alternatives Testing Market, Historic, 2015 – 2020, \$ Million



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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Table 20: Eastern Europe Non-Animal Alternatives Testing Market, Historic, 2015 – 2020, \$ Million

Market	2015	2016	2017	2018	2019	2020	HCAGR (2015 – 2020)
Non-Animal Alternatives Testing	40.9	43.5	45.1	48.5	50.5	51.7	4.8%

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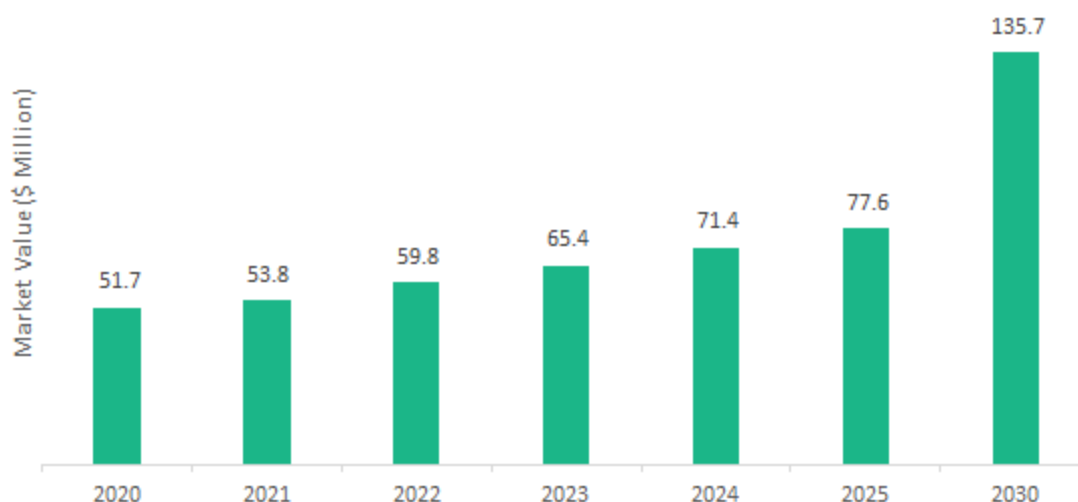
Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

The Eastern Europe non-animal alternatives testing market grew from \$40.9 million in 2015 to \$51.7 million in 2020 at a compound annual growth rate (CAGR) of 4.8%. The growth in the historic period can be attributed to demand for personalized medication, entry of new advanced models of non-animal alternatives testing devices, increasing need for early detection of drug toxicity, the rising ban on the use of animals for cosmetics testing. For instance, in June 2019, the EU regulators announced the ban on animal tests for cosmetics that were being used for testing in France, the Czech Republic, Spain, and Romania previously.^{xvii}

Eastern Europe Non-Animal Alternatives Testing Market, Forecast Market Growth, 2020 – 2025, 2030F Value (\$ Million)

The chart and table below show the year-on-year growth of the Eastern Europe non-animal alternatives testing forecast market during 2020 – 2025, 2030F.

Figure 9: Eastern Europe Non-Animal Alternatives Testing Market, Forecast, 2020 – 2025, 2030F, \$ Million



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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Table 21: Eastern Europe Non-Animal Alternatives Testing Market, Forecast, 2020 – 2025, 2030F, \$ Million

Market	2020	2021	2022	2023	2024	2025	2030	CAGR (2020 – 2025)	CAGR (2025 – 2030)
Non-Animal Alternatives Testing	51.7	53.8	59.8	65.4	71.4	77.6	135.7	8.4%	11.8%

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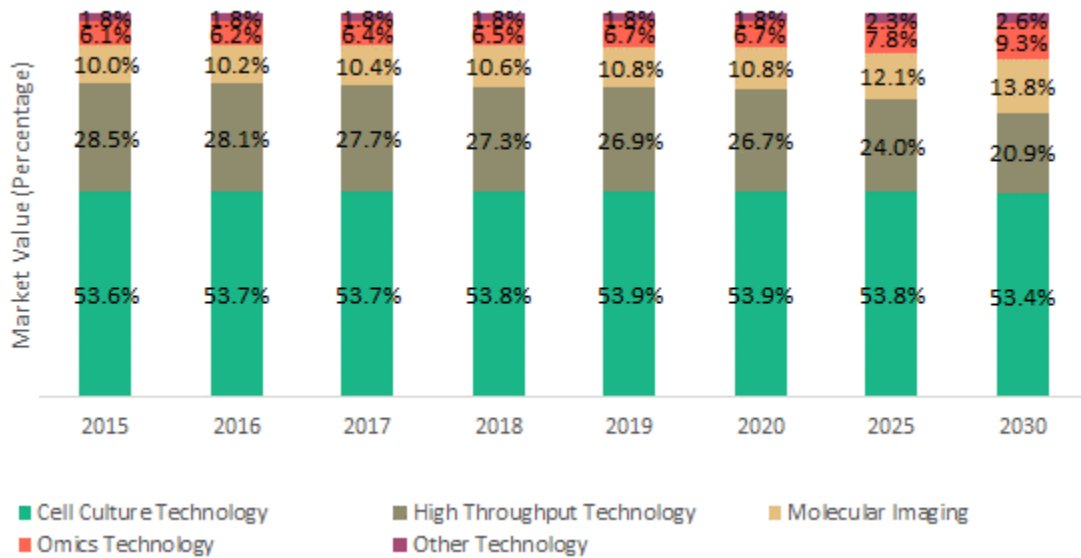
Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

The Eastern Europe non-animal alternatives testing market is expected to grow from \$51.7 million in 2020 to \$77.6 million in 2025 at a compound annual growth rate (CAGR) of 8.4%. The market is expected to grow to \$135.7 million in 2030 at a compound annual growth rate (CAGR) of 11.8%. The growth in the forecast period can be attributed to the rising need for alternatives for animal testing and the increasing end-users industry. For instance, the pharmaceutical industry in Russia is expected to grow from \$15.55 billion in 2020 to \$20.95 billion in 2025, at a CAGR of 6.0%. In the Czech Republic, it is expected to grow from \$3.96 billion in 2020 to \$5.19 billion in 2025, at a CAGR of 6.0%, and in Poland, it is expected to grow from \$6.27 billion in 2020 to \$8.94 billion in 2025, at a CAGR of 7.0%^{xcviii}

Eastern Europe Non-Animal Alternatives Testing Market, Segmentation By Technology, Historic And Forecast, 2015 – 2020, 2025F, 2030F, Value (\$ Million)

The chart and table below show the year-on-year growth of the Eastern Europe non-animal alternatives testing market and its segments by technology during 2015 – 2020, 2025F, 2030F.

Figure 10: Eastern Europe Non-Animal Alternatives Testing Market, Segmentation By Technology, Historic And Forecast, 2015 – 2020, 2025F, 2030F, %



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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Table 22: Eastern Europe Non-Animal Alternatives Testing Market, Segmentation By Technology, Historic And Forecast, 2015 – 2020, 2025F, 2030F, %

Market	Year								CAGR		
	2015	2016	2017	2018	2019	2020	2025	2030	15-20	20-25	25-30
Cell Culture Technology	53.6%	53.7%	53.7%	53.8%	53.9%	53.9%	53.8%	53.4%	4.9%	8.4%	11.7%
High Throughput Technology	28.5%	28.1%	27.7%	27.3%	26.9%	26.7%	24.0%	20.9%	3.5%	6.1%	8.8%
Molecular Imaging	10.0%	10.2%	10.4%	10.6%	10.8%	10.8%	12.1%	13.8%	6.5%	10.9%	14.8%
Omics Technology	6.1%	6.2%	6.4%	6.5%	6.7%	6.7%	7.8%	9.3%	7.0%	11.7%	15.8%
Other Technology	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	2.3%	2.6%	4.6%	14.2%	14.1%
Non-Animal Alternatives Testing	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	4.8%	8.4%	11.8%

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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Table 23: Eastern Europe Non-Animal Alternatives Testing Market, Segmentation By Technology, Historic And Forecast, 2015 – 2020, 2025F, 2030F, \$ Million

Market	Year								CAGR		
	2015	2016	2017	2018	2019	2020	2025	2030	15-20	20-25	25-30
Cell Culture Technology	21.9	23.3	24.2	26.1	27.2	27.9	41.7	72.5	4.9%	8.4%	11.7%
High Throughput Technology	11.7	12.2	12.5	13.2	13.6	13.8	18.6	28.4	3.5%	6.1%	8.8%
Molecular Imaging	4.1	4.4	4.7	5.1	5.4	5.6	9.4	18.7	6.5%	10.9%	14.8%
Omics Technology	2.5	2.7	2.9	3.2	3.4	3.5	6.1	12.6	7.0%	11.7%	15.8%
Other Technology	0.7	0.8	0.8	0.9	0.9	0.9	1.8	3.5	4.6%	14.2%	14.1%
Non-Animal Alternatives Testing	40.9	43.5	45.1	48.5	50.5	51.7	77.6	135.7	4.8%	8.4%	11.8%

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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

The cell culture technology market was the largest segment in the Eastern Europe non-animal alternatives testing market. The market grew from \$21.9 million in 2015 to \$27.9 million in 2020 at a compound annual growth rate (CAGR) of 4.9%. The market is expected to grow to \$41.7 million in 2025 at a compound annual growth rate (CAGR) of 8.4%, and to \$72.5 million in 2030 at a compound annual growth rate of 11.7%.

The high throughput technology market was the second largest segment in the Eastern Europe non-animal alternatives testing market. The market grew from \$11.7 million in 2015 to \$13.8 million in 2020 at a compound annual growth rate (CAGR) of 3.5%. The market is expected to grow to \$18.6 million in 2025 at a compound annual growth rate (CAGR) of 6.1%, and to \$28.4 million in 2030 at a compound annual growth rate of 8.8%.

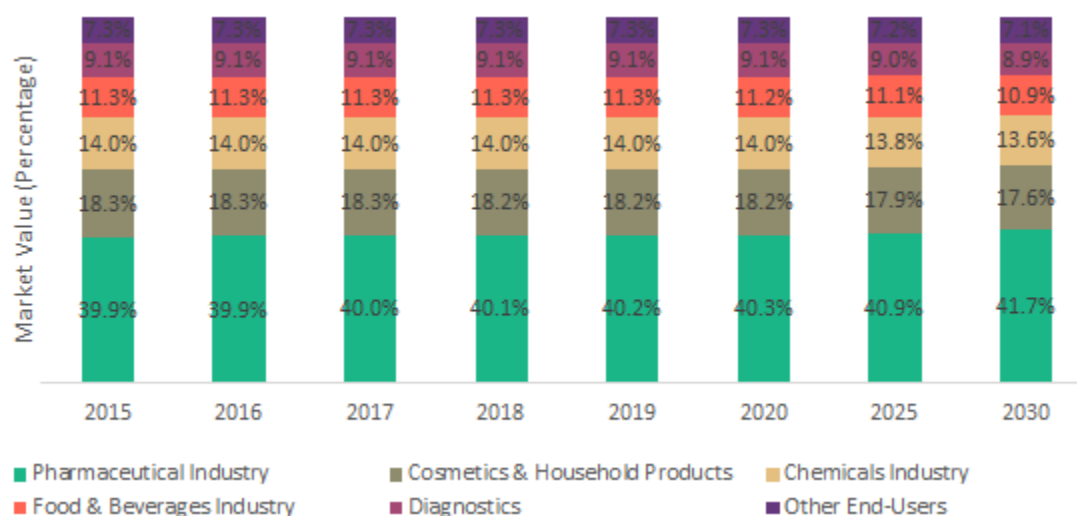
The other technology market was the smallest segment in the Eastern Europe non-animal alternatives testing market. The market grew from \$0.7 million in 2015 to \$0.9 million in 2020 at a compound annual growth rate (CAGR) of 4.6%. The market is expected to grow to \$1.8 million in 2025 at a compound annual growth rate (CAGR) of 14.2%, and to \$3.5 million in 2030 at a compound annual growth rate of 14.1%.

The Eastern Europe non-animal alternatives testing market grew from \$40.9 million in 2015 to \$51.7 million in 2020 at a compound annual growth rate (CAGR) of 4.8%. The market is expected to grow to \$77.6 million in 2025 at a compound annual growth rate (CAGR) of 8.4%, and to \$135.7 million in 2030 at a compound annual growth rate of 11.8%.

Eastern Europe Non-Animal Alternatives Testing Market, Segmentation By End Users, Historic And Forecast, 2015 – 2020, 2025F, 2030F, Value (\$ Million)

The chart and table below show the year-on-year growth of the Eastern Europe non-animal alternatives testing market and its segments by end users during 2015 – 2020, 2025F, 2030F.

Figure 11: Eastern Europe Non-Animal Alternatives Testing Market, Segmentation By End Users, Historic And Forecast, 2015 – 2020, 2025F, 2030F, %



The Business Research Company

Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Table 24: Eastern Europe Non-Animal Alternatives Testing Market, Segmentation By End Users, Historic And Forecast, 2015 – 2020, 2025F, 2030F, %

Market	Year								CAGR		
	2015	2016	2017	2018	2019	2020	2025	2030	15-20	20-25	25-30
Pharmaceutical Industry	39.9%	39.9%	40.0%	40.1%	40.2%	40.3%	40.9%	41.7%	5.0%	8.8%	12.3%
Cosmetics & Household Products	18.3%	18.3%	18.3%	18.2%	18.2%	18.2%	17.9%	17.6%	4.6%	8.2%	11.4%
Chemicals Industry	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	13.8%	13.6%	4.7%	8.2%	11.5%
Food & Beverages Industry	11.3%	11.3%	11.3%	11.3%	11.3%	11.2%	11.1%	10.9%	4.6%	8.2%	11.5%
Diagnostics	9.1%	9.1%	9.1%	9.1%	9.1%	9.1%	9.0%	8.9%	4.6%	8.3%	11.7%
Other End-Users	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%	7.2%	7.1%	4.7%	8.3%	11.6%
Non-Animal Alternatives Testing	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	4.8%	8.4%	11.8%

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Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

Table 25: Eastern Europe Non-Animal Alternatives Testing Market, Segmentation By End Users, Historic And Forecast, 2015 – 2020, 2025F, 2030F, \$ Million

Market	Year								CAGR		
	2015	2016	2017	2018	2019	2020	2025	2030	15-20	20-25	25-30
Pharmaceutical Industry	16.3	17.4	18.1	19.4	20.3	20.8	31.8	56.6	5.0%	8.8%	12.3%
Cosmetics & Household Products	7.5	8.0	8.2	8.8	9.2	9.4	13.9	23.9	4.6%	8.2%	11.4%
Chemicals Industry	5.7	6.1	6.3	6.8	7.1	7.2	10.7	18.5	4.7%	8.2%	11.5%
Food & Beverages Industry	4.6	4.9	5.1	5.5	5.7	5.8	8.6	14.8	4.6%	8.2%	11.5%
Diagnostics	3.7	4.0	4.1	4.4	4.6	4.7	7.0	12.1	4.6%	8.3%	11.7%
Other End-Users	3.0	3.2	3.3	3.5	3.7	3.8	5.6	9.7	4.7%	8.3%	11.6%
Non-Animal Alternatives Testing	40.9	43.5	45.1	48.5	50.5	51.7	77.6	135.7	4.8%	8.4%	11.8%

The Business Research Company

Sources: [National Statistics Offices](#), [UN Comtrade](#), [TBRC Analysis](#), [TBRC Estimates](#), [TBRC Secondary](#)

The pharmaceutical industry market was the largest segment in the Eastern Europe non-animal alternatives testing market. The market grew from \$16.3 million in 2015 to \$20.8 million in 2020 at a compound annual growth rate (CAGR) of 5.0%. The market is expected to grow to \$31.8 million in 2025 at a compound annual growth rate (CAGR) of 8.8%, and to \$56.6 million in 2030 at a compound annual growth rate of 12.3%.

The cosmetics & household products market was the second largest segment in the Eastern Europe non-animal alternatives testing market. The market grew from \$7.5 million in 2015 to \$9.4 million in 2020 at a compound annual growth rate (CAGR) of 4.6%. The market is expected to grow to \$13.9 million in 2025 at a compound annual growth rate (CAGR) of 8.2%, and to \$23.9 million in 2030 at a compound annual growth rate of 11.4%.

The other end-users market was the smallest segment in the Eastern Europe non-animal alternatives testing market. The market grew from \$3 million in 2015 to \$3.8 million in 2020 at a compound annual growth rate (CAGR) of 4.7%. The market is expected to grow to \$5.6 million in 2025 at a compound annual growth rate (CAGR) of 8.3%, and to \$9.7 million in 2030 at a compound annual growth rate of 11.6%.

The Eastern Europe non-animal alternatives testing market grew from \$40.9 million in 2015 to \$51.7 million in 2020 at a compound annual growth rate (CAGR) of 4.8%. The market is expected to grow to \$77.6 million in 2025 at a compound annual growth rate (CAGR) of 8.4%, and to \$135.7 million in 2030 at a compound annual growth rate of 11.8%.

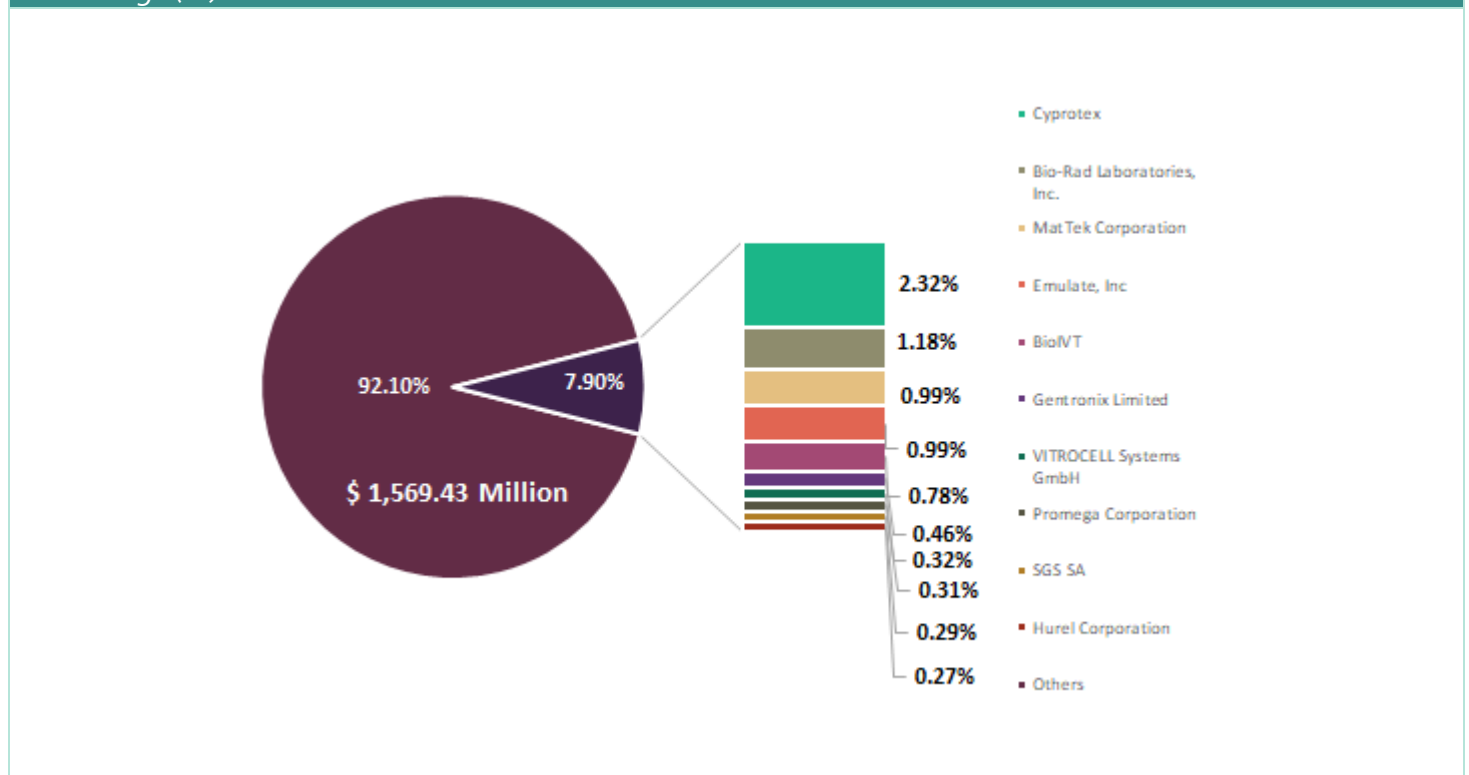
Non-Animal Alternatives Testing Market

Competitive Landscape

The global non-animal alternatives testing market is fragmented, with a large number of players. The top ten competitors in the market made up to 7.90% of the total market in 2020. The market consolidation can be attributed to the partnerships and collaborations among the players in the industry to save costs, enhance their product offerings and expand geographically. The market is expected to be concentrated state in near future with the adoption of acquisition and merger strategies by the players to enter and expand into newer geographies. Cyprotex was the largest competitor with 2.32% share of the market, followed by Bio-Rad Laboratories with 1.18%, MatTek Corporation with 0.99%, Emulate, Inc with 0.99%, BioIVT with 0.78%, Gentronix Limited with 0.46%, VITROCELL Systems GmbH with 0.32%, Promega Corporation with 0.31%, SGS SA with 0.29% and Hurel Corporation with 0.27%.

The figure below displays the percentage market share of the top players in the non-animal alternatives testing market.

Figure 12: Global Non-Animal Alternatives Testing Market, Key Competitor Estimated Market Shares, 2020, Percentage (%)



The Business Research Company
 Sources: Annual Report, TBRC Analysis, TBRC Estimates

Table 26: Global Non-Animal Alternatives Testing Market, Key Competitor Estimated Market Shares, 2020, Percentage (%)

Competitor	Market Share	Revenue (\$ Million)	Competitor	Market Share	Revenue (\$ Million)
Cyprotex	2.32%	36.40	VITROCELL Systems GmbH	0.32%	5.00
Bio-Rad Laboratories, Inc.	1.18%	18.48	Promega Corporation	0.31%	4.88
MatTek Corporation	0.99%	15.60	SGS SA	0.29%	4.53
Emulate, Inc	0.99%	15.48	Hurel Corporation	0.27%	4.20
BioIVT	0.78%	12.28	Others	92.10%	1,445.39
Gentronix Limited	0.46%	7.20			

The Business Research Company
 Sources: Annual Report, TBRC Analysis, TBRC Estimates

Cyprotex generated estimated revenues of \$36.40 million for the financial year 2020 from this market.

Bio-Rad Laboratories, Inc. generated estimated revenues of \$18.48 million for the financial year 2020 from this market, a 39.0% increase over the previous year.

MatTek Corporation generated estimated revenues of \$15.60 million for the financial year 2020 from this market.

Emulate, Inc generated estimated revenues of \$15.48 million for the financial year 2020 from this market.

BioIVT generated estimated revenues of \$12.28 million for the financial year 2020 from this market.

Gentronix Limited generated estimated revenues of \$7.20 million for the financial year 2020 from this market.

VITROCELL Systems GmbH generated estimated revenues of \$5.00 million for the financial year 2020 from this market.

Promega Corporation generated estimated revenues of \$4.88 million for the financial year 2020 from this market.

SGS SA generated estimated revenues of \$4.53 million for the financial year 2020 from this market, a 17.5% decrease over the previous year.

Simulab Corporation generated estimated revenues of \$4.20 million for the financial year 2020 from this market.

Company Profiles

Cyprotex

Company Overview

Cyprotex was the largest competitor in the non-animal alternatives testing market in 2020, with a 2.32% share of the market. Cyprotex specializes in in-vitro and in-silico ADME-Tox services. Cyprotex has sites at Alderley Park near Macclesfield, UK and in Watertown near Boston, USA. The Company was founded in 1999 and was acquired by Evotec Company in 2016^{xcix}.

Products And Services

The company specializes in in-vitro and in-silico ADME-Tox services. This includes in vitro ADME screening to support discovery projects, regulatory in vitro ADME and DDI studies during preclinical and clinical development, specialist mechanistic in vitro human, animal toxicity models (e.g., 3D models and MEA electrophysiology), and PBPK/QSAR modelling expertise. Its laboratory is supported by a team of software engineers who work with the scientists to improve efficiency through LabSysTM, an internally built LIMS (laboratory information management system). This system provides support for compound registration, plate mapping, bar code reading, liquid handling, and analytical automation as well as data processing. The company's services include high throughput ADME screening & customized ADME assays, in vitro toxicology, biosciences, in silico pharmacokinetic modelling, physicochemical profiling, and drug discovery services^c.

The company is completely involved in providing products covered in the non-animal alternatives testing market.

Business Strategy

Cyprotex's growth strategy is focused on expanding its technology and research & development capabilities by acquiring companies with the same business. For instance, in November 2021, Evotec SE (parent company of Cyprotex) and EQRx, a new type of pharmaceutical company committed to developing and delivering important new medicines to patients at radically lower prices, announced a collaboration to design, discover and develop new therapeutic options for patients. The collaboration will focus on multiple therapeutic targets in oncology and immunology. Under the terms of the agreement, EQRx and Evotec will collaborate on drug discovery, pre-clinical and clinical development. Evotec will lead drug discovery and pre-clinical development efforts, and EQRx will be responsible for clinical development, regulatory, and commercialization efforts^{ci}.

Financial Overview

Cyprotex generated estimated revenues of \$36.40 million from the non-animal alternatives testing market, during the financial year 2020. The revenues are TBRC estimates based on the various products offered by the company as none of the divisions directly align with the market.

Bio-Rad Laboratories, Inc.

Company Overview

Bio-Rad Laboratories, Inc. was the second largest competitor in the non-animal alternatives testing market in 2020 with 1.18% share of the market. Bio-Rad Laboratories manufactures and markets chemical, biological materials, and instruments used in life science research, healthcare, analytical chemistry, and other markets. The company was founded in 1952 and is based in Hercules, California, United States.^{cii} As of December 31, 2020, Bio-Rad Laboratories had approximately 8,000 employees, the majority of which are full-time employees^{ciii}.

Products And Services

The company operates through the following business divisions –

The **Life Science** division offers reagents, kits, and instruments used for biological research in various industries such as pharmaceutical and biotechnology, food testing, and government and industrial research. The company develops, manufactures, and markets approximately 6,000 reagents, apparatus, and laboratory instruments that serve a global customer base. Many of their products are used in established research techniques, biopharmaceutical production processes, and food testing regimes.

The above-mentioned division is partially involved in providing products covered in the non-animal alternatives testing market.

The **Clinical Diagnostics** division develops, manufactures, sells, and services automated test systems, informatics systems, test kits, and specialized quality controls for the healthcare market. These products are sold to reference laboratories, hospital laboratories, state newborn screening facilities, physicians' office laboratories, transfusion laboratories, and insurance and forensic testing laboratories

The **Other Operations** division includes their Analytical Instruments division and a small miscellaneous operation that was included in a prior acquisition^{civ}.

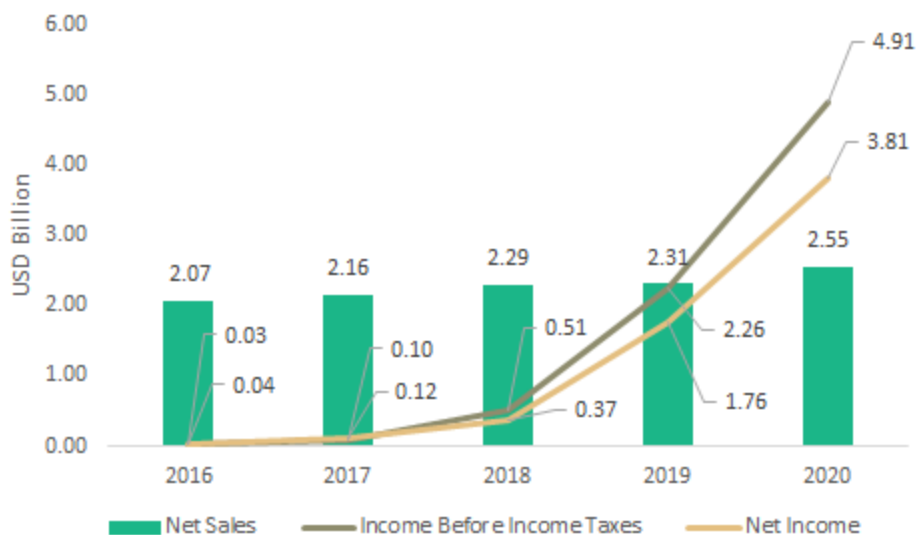
Business Strategy

Bio-Rad Laboratories' growth strategy is focused on strengthening its business by launching systems for in vivo and another testing. For instance, in October 2021, Bio-Rad Laboratories announced the launch of the CFX Opus 96 Dx System and CFX Opus 384 Dx System on Oct. 20, 2021. These instruments provide real-time polymerase chain reaction (PCR) detection for in-vitro diagnostics (IVD) testing. The Opus 96 and Olpus 384 offer accurate and precise quantification to improve assay development and workflow efficiencies and productivity for diagnostic testing and research. Additionally, both are open systems that can multiplex up to five targets to provide IVD assay development and testing^{cv}.

Financial Overview

The chart and table below show the financial overview of Bio-Rad Laboratories, Inc. during 2016 – 2020

Figure 13: Bio-Rad Laboratories, Inc. – Financial Overview, 2016 – 2020, \$ Billion



The Business Research Company

Sources: Annual Reports^{cvii}, TBRC Estimates, TBRC Analysis

Table 27: Bio-Rad Laboratories, Inc. – Financial Overview, 2016 - 2020, \$ Billion

Year	2016	2017	2018	2019	2020	CAGR
Net Sales	2.07	2.16	2.29	2.31	2.55	5.33%
Income Before Income Taxes	0.04	0.10	0.51	2.26	4.91	-
Net Income	0.03	0.12	0.37	1.76	3.81	-

The Business Research Company

Sources: Annual Report^{cvii}, TBRC Analysis, TBRC Estimates

Bio-Rad Laboratories, Inc. generated net sales of \$2.55 billion for the financial year 2020, a 10.1% increase from the previous year. As of December 06, 2021, the share price of Bio-Rad Laboratories, Inc. listed on the New York Stock Exchange is \$742.36 and the total market capitalization is \$22.18 billion^{cviii}.

Bio-Rad Laboratories, Inc. had income before income taxes of \$0.04 billion for the financial year 2016, and \$4.91 billion in 2020. Bio-Rad Laboratories, Inc. had a net income of \$0.03 billion for the financial year 2016 and \$3.81 billion in 2020.

BioRad net income and income before taxes values show a significant increase (than normal past 3 years) due to changes in the market value of their position in Sartorius AG. The change in fair market value on their equity securities for the year ended December 31, 2020, was a \$4,495.8 million gain, which was primarily due to their investment in Sartorius AG^{cix}.

Bio-Rad Laboratories, Inc. generated estimated revenues of \$18.48 million from the non-animal alternatives testing market, during the financial year 2020. The revenues are TBRC estimates based on the various products offered by the company as none of the divisions directly align with the market.

MatTek Corporation

Company Overview

MatTek Corporation was the third largest competitor in the non-animal alternatives testing market in 2020, with a 0.99% share of the market. MatTek has been developing innovative life science technologies and unmatched expertise in the field of in vitro science. The company was founded in 1985 and is currently headquartered in Ashland, Massachusetts, USA^{cx}.

Products And Services

MatTek Corporation is an in-vitro life science company that offers 3D reconstructed tissue models. The company introduced EpiDerm™ in 1993, one of the earliest 3D human cell-based in-vitro models aimed to evaluate the toxicology and efficacy of molecules in the cosmetics, chemical, pharmaceutical, and household product industries. The company offers products such as tissue models, primary cells & media, and culture-ware (plates, dishes, and slides). These advanced tissue models empower companies to achieve their goals of non-animal testing while lowering testing costs and providing human-relevant results^{cx1}. The company products include EpiOral™, EpiGingival™, EpiCorneal™, EpiOcular™, EpiAirway™, EpiIntestinal™, EpiVagina™, EpiDerm™, MelanoDerm™, Normal Human Bronchial Epithelial Cells (NHBE), Glass Bottom Dishes, Multi-well plates, cover-slips, and cell culture slides.^{cxii}

The company is partially involved in providing products covered in the non-animal alternatives testing market.

Business Strategy

MatTek Corporation's growth strategy is focusing on increasing awareness about 3D biomanufacturing and in vitro analysis services by collaborating with companies having the same business. For instance, in September 2021, BICO subsidiaries CELLINK, MatTek, and Visikol announced the launch of a collaboration combining the expertise of the three companies to establish a contract research organization (CRO) with comprehensive bioprinting services. By forming a joint CRO, CELLINK, MatTek and Visikol have granted their customers access to offerings from all three companies^{cxiii}.

Financial Overview

MatTek Corporation generated estimated revenues of \$15.60 million from the non-animal alternatives testing market, during the financial year 2020. The revenues are TBRC estimates based on the various products offered by the company as none of the divisions directly align with the market.

Emulate, Inc

Company Overview

Emulate, Inc was the fourth largest competitor in the non-animal alternatives testing market in 2020, with a 0.99% share of the market. Emulate, Inc. (Emulate) is a biotechnology company that commercialized Organs-on-Chips technology—a human cell-based technology that recreates organ-level function to model organs in healthy and diseased states. The technology has applications in pharmaceutical research, product development, testing how different medicines, chemicals, and foods affect human health. The company was founded in 2013 and is currently headquartered in Boston, Massachusetts, USA.

Products And Services

Emulate, Inc., is a biotechnology company that spun off from the Wyss Institute at Harvard University, specializes in developing a variety of organs-on-chips (OOCs), and provides services such as designing, executing and managing studies used for R&D and drug development in the biopharma, food, cosmetics, chemicals, and, medicine industries. The company provides a human emulation system comprising organ chips, instrumentation, and software applications (apps). In addition, it provides formulation testing on OOCs, delivery and uptake of viral vectors, and bio-kits that allows end-users to create a wide range of organ models.

Emulate's alternative animal testing technologies include organ-on-chip supported models and enabled models along with instrumentation (Culture model, Hub model & stretchable chips) and companion products (Fixed chip imaging adapter).

The company is partially involved in providing products covered in the non-animal alternatives testing market report

Business Strategy

Emulate, Inc's growth strategy is focused on strengthening its product portfolio by investing in its business. For instance, in September 2021, Emulate Inc. closed an \$82 million Series E round. This latest round is intended to formulate a massive investment in a "roadmap" for developing model organ systems created to fit drug makers' needs and bring the idea of an organ-on-a-chip into use in the lab. In January 2021, Emulate announced several new products and services that are part of this roadmap. They include the Emulate brain chip, designed to aid with research into central nervous system disorders (like Alzheimer's), an immune cell recruitment application that will investigate how the immune system interacts across the lungs, liver, and intestine (using lung-chips, liver-chips, and intestine chips), and a microbiome model integrated into the liver chip^{cxiv}.

Financial Overview

Emulate, Inc generated estimated revenues of \$15.48 million from the non-animal alternatives testing market, during the financial year 2020. The revenues are TBRC estimates based on the various products offered by the company as none of the divisions directly align with the market.

BioIVT

Company Overview

BioIVT was the fifth largest competitor in the non-animal alternatives testing market in 2020 with 0.78% share of the market. BioIVT, formerly BioreclamationIVT, is a leading global provider of high-quality biological specimens and value-added services. It specializes in control and disease state samples including human and animal tissues, cell products, blood, and other biofluids. Its Research Services team works collaboratively with clients to provide in vitro hepatic modeling solutions. The company was founded in 1981 and is currently headquartered in Westbury, New York, USA^{cxv}.

Products And Services

BioIVT is involved in providing biological products to life sciences and pharmaceutical companies. The company is committed to providing the highest quality human and animal biological matrices, and processing services.^{cxvi} The company's products include biofluids (blood-derived), biofluids (other), cell products, media/reagents/kits, molecular products, subcellular fractions, tissue, and custom product^{cxvii}. The company's services include cell biology/disease modeling, drug-drug interactions (DDI), gene expression, hepatobiliary disposition, hepatotoxicity, liver disease modeling, metabolism, microarray, pathology/clinical data, and transporter assays^{cxviii}.

The company is partially involved in providing products covered in the non-animal alternatives testing market report

Business Strategy

BioIVT's growth strategy aims at strengthening its business by acquiring companies with the same business. For instance, in July 2021, BioIVT announced the acquisition of Tissue Solutions Ltd., a virtual biobank based in Glasgow, UK. Tissue Solutions provides medical researchers with high-quality human tissue and other biological materials for use in drug discovery, target identification and validation, assay development and validation, and biomarker and companion diagnostic development. This acquisition will add 150 collection sites to BioIVT's network, giving them greater access to high-quality control and disease state biospecimens and increased global reach for prospective collections. Furthermore, it will expand BioIVT's skin product offerings for in vitro models^{cxix}.

Financial Overview

BioIVT generated estimated revenues of \$12.28 million from the non-animal alternatives testing market, during the financial year 2020. The revenues are TBRC estimates based on the various products offered by the company as none of the divisions directly align with the market.

Appendix

Market Data Sources

Table 28: Non-Animal Alternatives Testing - Market Data Sources

Source	URL
National Statistic Offices	https://www.indec.gob.ar/ ; http://www.abs.gov.au/ ; https://www.statistik.at/web_en/ ; https://statbel.fgov.be/en/ ; https://www2.ibge.gov.br/home/default.php ; http://www.statcan.gc.ca/ ; http://www.ine.cl/ ; http://www.stats.gov.cn/english/ ; http://www.dane.gov.co/index.php/en/ ; http://kostat.go.kr/portal/eng/index.action ; https://www.dst.dk/en/ ; http://www.capmas.gov.eg/?lang=2 ; https://www.tilastokeskus.fi/index_en.html ; https://www.insee.fr/en/accueil ; https://www.destatis.de/EN/Homepage.html ; https://www.censtatd.gov.hk/home/ ; http://mospi.nic.in/# ; https://www.bps.go.id/ ; http://www.cso.ie/en/index.html ; http://www.cbs.gov.il/reader/cw_usr_view_Folder?ID=141 ; http://www.istat.it/en/ ; http://www.stat.go.jp/english/index.htm ; https://www.dosm.gov.my/v1/ ; http://en.www.inegi.org.mx/ ; https://opendata.cbs.nl/statline/#/CBS/en/navigatieScherm/thema?themaNr=5350 ; https://www.stats.govt.nz/ ; http://www.nigerianstat.gov.ng/ ; https://www.ssb.no/en/ ; https://www.inei.gob.pe/ ; http://psa.gov.ph/ ; http://stat.gov.pl/en/ ; https://www.ine.pt/xportal/xmain?xpgid=ine_main&xpid=INE ; http://www.insse.ro/cms/en/ ; http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/en/main/ ; https://www.singstat.gov.sg/ ; https://www.stats.gov.sa/ ; http://www.statssa.gov.za/ ; https://www.czso.cz/csu/czso/home ; http://www.ine.es/en/welcome.shtml ; http://www.scb.se/en/ ; https://www.bfs.admin.ch/bfs/en/home.html ; http://web.nso.go.th/ ; http://www.turkstat.gov.tr/Start.do;jsessionid=nZhGhvpT3DQ7vWJt3c8HcMJGXjhyhPNh24yPpJzbnRFKwqHLGWrq!-270508800 ; http://fcsa.gov.ae/en-us ; https://www.ons.gov.uk/ ; https://census.gov/ ; http://www.ine.gov.ve/ ; https://www.gso.gov.vn/Default.aspx?tabid=217
Directorate-General of the European Commission	https://ec.europa.eu/eurostat
World Mining Council	http://www.world-mining-data.info/
International Monetary Fund	https://www.imf.org/external/index.htm
Organisation for Economic Co-operation and Development	http://www.oecd.org/
UN Comtrade Database	https://comtrade.un.org/
The Business Research Company	

Research Methodology

The Business Research Company's reports are based on the methodology below.

Global Market Model (GMM)

The Global Market Model is a comprehensive database of integrated market information which covers historic, current and forecast market information. This database helps in drawing multiple conclusions, exploring market opportunities and taking effective business decisions.

Global Market Model's methodology ensures that the data is of the highest quality. It starts with high standard data sources and correlation-based modelling techniques. This is supported by TBRC's market expertise and thousands of expert interviews conducted each year to verify the data.

The datasets on the global market model are created using a wide range of proprietary and public sources including leading government bodies, associations, trade journals, market intelligence reports and trade magazines. Data is modelled based on hard data, extrapolation, regression analysis based on known macro data inputs, interpolation between hard figures, comparisons with other geographies and markets, price estimations, and qualitative inputs. Data is triangulated within our unique market data model covering an exhaustive list of 600+ markets across 48 countries and 7 regions. Comparable data is used for sanity check and trend analysis. For example, our global market value data is compared to unit sales and price data for the relevant market as well as relevant macro-economic datasets in order to establish validity.

Market Numbers –

Market value is defined as the revenues earned by organizations for products and services within the specified market. The break down by geography is revenue generated within the specific industry by organizations in the specified geography, irrespective of where they are produced.

Competitor Market Share Data

The competitor market share data is intended to represent the companies that gain the most revenues from the given market and the percentage share of the market that they hold. If a company derives most of its revenues from the market, its revenues are given in full. If a large part of the company's revenues come from other markets, only the division of the company which operates in this market is included. Where accurate information is not available on the revenues a company generates from the market its market share is not included, however a profile of the company may still be included if it is a significant competitor in the market.

Analysis

Analysis is drawn from our Consultants' wide range of industry and research experience as well as public and proprietary sources. Consultants are trained in research techniques and ethics by the Market Research Society.

Verification Through Expert Interviews

Every year The Business Research Company carries out thousands of interviews with senior executives and industry experts across hundreds of markets. Through these interviews we develop our internal understanding of markets and geographies and cross reference our understanding of global markets with expert feedback utilizing 'Delphic' research methodologies.

Referencing

The Business Research Company prides itself on the quality and validity of its data and analysis. Our unique 'end noted' referencing approach allows the user to trace our market numbers and analysis back to the specific data sources they were derived from.

Note on Currency Conversions –

All currency conversions are carried out on the basis of 2019 exchange rates.

Currencies

\$ stands for US Dollar

€ stands for Euro

All other currencies are given with ISO currency codes.

Research Inquiries

If you have any inquiries relating the research services, please do not hesitate to get in touch.

Please contact info@tbrc.info for more information or call Europe +44 2071930708, Asia +91 8897263534, Americas +1 3156230293

The Business Research Company

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ⁱ <https://www.peta.org/issues/animals-used-for-experimentation/alternatives-animal-testing/>

ⁱⁱ <https://www.sciencedirect.com/science/article/pii/S1319016413001096>

ⁱⁱⁱ https://www.hsi.org/news-media/alternative_methods/

- ^{iv} <https://www.peta.org/issues/animals-used-for-experimentation/alternatives-animal-testing/>
- ^v <https://www.livescience.com/65401-animal-testing-alternatives.html>
- ^{vi} <https://www.sgs.com/en/news/2015/07/in-vitro-testing-alternative-methods-to-assess-toxicology-and-efficacy-of-cosmetics>
- ^{vii} <https://www.sgs.com/en/news/2015/07/in-vitro-testing-alternative-methods-to-assess-toxicology-and-efficacy-of-cosmetics>
- ^{viii} <https://ec.europa.eu/jrc/en/research-topic/alternatives-animal-testing-and-safety-assessment-chemicals>
- ^{ix} <https://www.wur.nl/en/article/Food-research-without-the-use-of-animal-tests.htm>
- ^x <https://techmonitor.ai/techonology/emerging-technology/organs-on-a-chip>
- ^{xi} <https://www.elcompanies.com/en/news-and-media/newsroom/press-releases/2019/06-20-2019>
- ^{xii} https://nc3rs.org.uk/sites/default/files/documents/NonAnimalTechCO082_RYE_4_nrfinal2.pdf
- ^{xiii} <https://www.emulatebio.com/blog/organ-chips-covid-19-insights>
- ^{xiv} <https://www.elcompanies.com/en/news-and-media/newsroom/press-releases/2019/06-20-2019>
- ^{xv} <https://www.peta.org/issues/animals-used-for-experimentation/alternatives-animal-testing/>
- ^{xvi} <https://www.healthysimulation.com/17821/simulab-airwayman-arterialine-trainer/>
- ^{xvii} <https://innovationorigins.com/en/3d-printing-and-simulations-to-substitute-for-animal-testing/>
- ^{xviii} <https://www.sciencetimes.com/articles/26637/20200728/3d-printers-miniature-organs-testing-potential-covid.htm>
- ^{xix} <https://www.niehs.nih.gov/health/topics/science/sya-iccvam/index.cfm>
- ^{xx} <https://www.nature.com/articles/d41586-019-02715-0>
- ^{xxi} <https://www.nature.com/articles/d41586-019-02715-0>
- ^{xxii} <https://www.news-medical.net/news/20201203/FDA-launches-pilot-program-to-help-reduce-and-replace-animal-testing-in-drug-development.aspx>
- ^{xxiii} http://www.jacvam.jp/files/news/opentox_2018.pdf
- ^{xxiv} <https://www.cosmetics-technology.com/news/oeecd-accepts-loreal-alternatives-animal-testing/>
- ^{xxv} <https://www.loreal-finance.com/eng/news-events/oeecd-has-adopted-two-new-alternatives-animal-testing-developed-loreal-assess-skin>
- ^{xxvi} <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7922590/>
- ^{xxvii} <https://mps.amegroups.com/article/view/4689/5479>
- ^{xxviii} <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/ForecastSummary.pdf>
- ^{xxix} <https://www.peta.org/issues/animals-used-for-experimentation/us-government-animal-testing-programs/peta-funds-non-animal-methods/>
- ^{xxx} <https://www.efpia.eu/media/25305/making-sense-of-animal-research-march-2008.pdf>
- ^{xxxi} <https://www.frontiersin.org/articles/10.3389/fphar.2018.01079/full>
- ^{xxxii} <https://www.globalmarketmodel.com/>
- ^{xxxiii} <https://data.imf.org/?sk=388dfa60-1d26-4ade-b505-a05a558d9a42>
- ^{xxxiv} <https://www.globalmarketmodel.com/>
- ^{xxxv} <https://www.imf.org/en/Data>
- ^{xxxvi} <https://data.worldbank.org/indicator/SH.XPD.GHED.PC.CD?view=chart>
- ^{xxxvii} <https://data.worldbank.org/indicator/SH.XPD.PVTD.PP.CD?view=chart>
- ^{xxxviii} <http://www.francopa.fr/web/francopa?page=home&out=txt&languageIhm=fr>
- ^{xxxix} <https://api.worldanimalprotection.org/country/france>
- ^{xl} <https://innovationorigins.com/en/million-dollar-grant-for-further-development-of-organ-chip/>
- ^{xli} <https://www.businesswire.com/news/home/20210302005511/en/CN-Bio-Awarded-Innovate-UK-Grant-to-Develop-Single-and-Multi-organ-Models-for-COVID-19-Research>
- ^{xlii} <https://www.longevity.technology/innovating-organ-on-chip-to-accelerate-research/>
- ^{xliiii} <https://www.inserm.fr/en/recherche-inserm/ethique/utilisation-animaux-fins-recherche/regulations-and-ethics-in-animal-studies>
- ^{xliv} <https://hirnforschung.kyb.mpg.de/en/the-law/the-german-animal-welfare-act.html>
- ^{xlv} https://www.cosmeticsdesign-europe.com/Article/2021/01/29/Global-animal-testing-ban-for-cosmetics-closer-to-EU-Parliament-2023-goal?utm_source=copyright&utm_medium=OnSite&utm_campaign=copyright
- ^{xlvi} <https://agriculture.gouv.fr/french-ministry-agriculture-and-food>
- ^{xlvii} https://www.bmel.de/EN/Home/home_node.html
- ^{xlviii} <https://www.bundesgesundheitsministerium.de/en/ministry/the-federal-ministry-of-health.html>
- ^{xlix} <https://www.rcpath.org/uploads/assets/4c73cb92-92cb-43fa-9e6098a17coea2ce/PathologyRegulationFinal-002.pdf>
- ^l <https://www.accredia.it/en/#:~:text=Accredia%20is%20the%20sole%20national,as%20testing%20and%20calibration%20laboratories.>
- ^{li} <https://norecopa.no/more-resources/organisations>
- ^{lii} <https://www.avalara.com/vatlive/en/country-guides/europe/uk/british-vat-rates.html>
- ^{liiii} <https://www.abda.de/en/pharmacies-in-europe/value-added-tax-in-the-eu#:~:text=In%20Germany%2C%20the%20value%20added,such%20as%20food%20or%20books.>
- ^{liv} <https://www.tmf-group.com/en/services/companies/accounting-tax/redirect,-c,-vat/country-profile/spain/#:~:text=Spain%20VAT%20rates,construction%20work%20and%20some%20newspapers.>
- ^{lv} <https://www.tmf-group.com/en/services/companies/accounting-tax/redirect,-c,-vat/country-profile/france/#:~:text=The%20standard%20VAT%20rate%20in,for%20sales%20in%20Corsica%20Island.>

- lvi <https://taxsummaries.pwc.com/italy/corporate/other-taxes#:~:text=The%20italian%20standard%20VAT%20rate,periodicals%20that%20meet%20certain%20requirements.>
- lvii www.britishgenerics.co.uk
- lviii <https://home.kpmg/us/en/home/insights/2020/01/tnf-france-corporate-tax-provisions-enacted-finance-law-2020.html>
- lix https://europa.eu/youreurope/business/taxation/business-tax/company-tax-eu/germany/index_en.htm
- lx <https://www.cpm.qmul.ac.uk/emulate/poc/>
- lxi <https://www.labbulletin.com/articles/perkinelmer-acquire-uk-invitro-diagnostics-company>
- lxii <https://www.biomerieux.com/en/amsp-partners-biomerieux-facilitate-supply-high-quality-covid-19-diagnostics>
- lxiii <https://www.eu-startups.com/2019/10/cambridge-based-sense-biodetection-raises-e14-million-to-develop-its-point-of-care-diagnostic-tests/>
- lxiv <https://www.roche.com/>
- lxv <https://www.siemens-healthineers.com/en-in/>
- lxvi <https://www.qiagen.com/>
- lxvii <https://www.biocartis.com/en>
- lxviii <https://www.biomerieux.com/>
- lxix <https://quantumdx.com/>
- lxx <https://data.imf.org/?sk=388dfa60-1d26-4ade-b505-a05a558d9a42>
- lxxi <https://www.globalmarketmodel.com/>
- lxxii <https://www.imf.org/en/Data>
- lxxiii <https://data.worldbank.org/indicator/SH.XPD.GHED.PC.CD?view=chart>
- lxxiv <https://data.worldbank.org/indicator/SH.XPD.PVTD.PP.CD?view=chart>
- lxxv <https://www.globalcosmeticsnews.com/russia-proposes-end-to-animal-testing-for-cosmetics/>
- lxxvi https://www.animallaw.info/statute/poland-cruelty-polish-animal-protection-act#Chapter_1
- lxxvii <https://ec.europa.eu/jrc/en/research-topic/alternatives-animal-testing-and-safety-assessment-chemicals>
- lxxviii <http://government.ru/en/department/23/>
- lxxix <https://www.ehfcn.org/members/poland/>
- lxxx <https://www.anm.ro/en/>
- lxxxi <http://www.sukl.eu/>
- lxxxii <http://www.msp.ua/registration-medicinal-products-ukraine.html>
- lxxxiii <https://norecopa.no/more-resources/organisations>
- lxxxiv [https://medicaldevicesinrussia.com/tag/vat/#:~:text=At%20the%20end%20of%20January,of%20updated%20resolution%20in%20Russian\).&text=The%20list%20of%20medical%20devices%20taxed%20at%200,last%20updated%20in%20November%202017.](https://medicaldevicesinrussia.com/tag/vat/#:~:text=At%20the%20end%20of%20January,of%20updated%20resolution%20in%20Russian).&text=The%20list%20of%20medical%20devices%20taxed%20at%200,last%20updated%20in%20November%202017.)
- lxxxv <https://www.jdsupra.com/legalnews/poland-enacts-new-measures-in-response-45896/>
- lxxxvi [https://www.ey.com/Publication/vwLUAssets/ey-worldwide-corporate-tax-guide-2019/\\$FILE/ey-worldwide-corporate-tax-guide-2019.pdf](https://www.ey.com/Publication/vwLUAssets/ey-worldwide-corporate-tax-guide-2019/$FILE/ey-worldwide-corporate-tax-guide-2019.pdf)
- lxxxvii [https://www.ey.com/Publication/vwLUAssets/ey-worldwide-corporate-tax-guide-2019/\\$FILE/ey-worldwide-corporate-tax-guide-2019.pdf](https://www.ey.com/Publication/vwLUAssets/ey-worldwide-corporate-tax-guide-2019/$FILE/ey-worldwide-corporate-tax-guide-2019.pdf)
- lxxxviii [https://www.ey.com/Publication/vwLUAssets/ey-worldwide-corporate-tax-guide-2019/\\$FILE/ey-worldwide-corporate-tax-guide-2019.pdf](https://www.ey.com/Publication/vwLUAssets/ey-worldwide-corporate-tax-guide-2019/$FILE/ey-worldwide-corporate-tax-guide-2019.pdf)
- lxxxix [https://www.ey.com/Publication/vwLUAssets/ey-worldwide-corporate-tax-guide-2019/\\$FILE/ey-worldwide-corporate-tax-guide-2019.pdf](https://www.ey.com/Publication/vwLUAssets/ey-worldwide-corporate-tax-guide-2019/$FILE/ey-worldwide-corporate-tax-guide-2019.pdf)
- xc [https://www.ey.com/Publication/vwLUAssets/ey-worldwide-corporate-tax-guide-2019/\\$FILE/ey-worldwide-corporate-tax-guide-2019.pdf](https://www.ey.com/Publication/vwLUAssets/ey-worldwide-corporate-tax-guide-2019/$FILE/ey-worldwide-corporate-tax-guide-2019.pdf)
- xc <https://www.biospectrumasia.com/news/83/16327/thermo-fisher-first-genetics-to-develop-next-gen-sequencing-based-diagnostics-in-russia.html>
- xcii <https://www.interlabservice.ru/en/>
- xciii <https://www.roche.com/careers/our-locations/europe/russia/roche-in-moscow.htm>
- xciv <https://geneme.eu/>
- xcv <https://www.siemens-healthineers.com/ua>
- xcvi <https://www.testlinecd.com/>
- xcvii <https://www.freepressjournal.in/health/animal-tests-for-cosmetics-banned-in-eu-2>
- xcviii <https://www.globalmarketmodel.com/>
- xcix <https://www.cyprotex.com/aboutus>
- c <https://www.cyprotex.com/aboutus>
- ci <https://www.evotec.com/en/investor-relations/news/corporate-news/p/evotec-and-eqr-x-announce-integrated-drug-discovery-and-development-partnership-6124>
- cii <https://www.bio-rad.com/en-in/corporate/about-bio-rad?ID=1003>
- ciii https://www.bio-rad.com/webroot/web/pdf/corporate/literature/Annual_Report_2020.pdf
- civ https://www.bio-rad.com/webroot/web/pdf/corporate/literature/Annual_Report_2020.pdf
- cv <https://www.pharmtech.com/view/bio-rad-launches-real-time-pcr-detection-systems-for-in-vitro-diagnostics>
- cvi https://www.bio-rad.com/webroot/web/pdf/corporate/literature/Annual_Report_2020.pdf
- cvii https://www.bio-rad.com/webroot/web/pdf/corporate/literature/Annual_Report_2020.pdf
- cviii <https://www.marketwatch.com/investing/stock/bio>

^{cxix} https://www.bio-rad.com/webroot/web/pdf/corporate/literature/Annual_Report_2020.pdf

^{cx} <https://www.mattek.com/about/>

^{cxix} <https://www.mattek.com/about/>

^{cxii} <https://www.mattek.com/products/>

^{cxiii} <https://www.mattek.com/bico-launches-3d-bioprinting-cro/>

^{cxiv} https://techcrunch.com/2021/09/07/emulate-inc-closes-82m-series-e-to-fund-expansion-of-organ-on-a-chip-products/?guccounter=1&guce_referrer=aHRocHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAN2b2ZoFoiYDna6svGsUGCVpYrHfY1yuT4v-sdFXgbBp9OnJqqIODFvA5u2rNTfzGv8RdZxppOlFjoLyv_FOfqgzDuLc_euuiHQsdLLtnsTRKduexsjll8SJWJVCAvFzMxW15ZjlUaCKsUm6TcNHCIFkO4c52zncHu5W3HYO4Sm

^{cxv} <https://bioivt.com/about/company-profile>

^{cxvi} <https://bioivt.com/about>

^{cxvii} <https://bioivt.com/products>

^{cxviii} <https://bioivt.com/services>

^{cxix} <https://bioivt.com/about/press-releases?entry=BioIVT%20Acquires%20Tissue%20Solutions%20Ltd.,%20a%20UK-based%20Virtual%20Biobank>