THE CONSUMER CASE FOR INTELLECTUAL PROPERTY

Innovation only happens if incentives are safeguarded

Fred Roeder
ECR Party is formerly known as ACRE PPEU. Registered in Belgium as a not-for-profit organisation and partially funded by the European Parliament.
Fred Roeder is a German Health Economist and Managing Director of the Consumer Choice Center. He has been consulting governments, non-profits, and the private sector on economic reforms in two dozen countries with a strong focus on emerging markets and post-communist countries. He has helped to modernize hospital and primary care delivery in several countries and actively helped to bring orphan drugs low and middle income countries. Besides healthcare, his research areas are transportation, telecommunication, and digital technologies. He is a board member of several technology companies in Europe and North America and on advisory boards of several nonprofits and for-profit corporations. Among many op-eds and media appearances, he has been published in the Frankfurter Allgemeine Zeitung, Wirtschaftswoche, Die Welt, the BBC, SunTV, ABC Portland News, Montreal Gazette, The Globe and Mail, Politico Europe, Euractiv, Vocal Europe, Handelsblatt, Huffington Post Germany, CityAM, L’Agefi, and The Guardian.
**Acknowledgements**

Throughout the writing of this policy paper I have received a great deal of support and assistance. I would first like to thank my colleagues Yael Ossowski, Luca Bertoletti, Bill Wirtz, David Clement, and Maria Chaplia for helping me with proofreading, translations, and some research. I would also like to acknowledge my colleague Fabio Fernandes for his wonderful support with creating graphics. I would particularly like to single out the support of the European Conservatives and Reformists Party who made this paper possible. A further thanks to Phil Stevens from the Geneva Network who keeps pushing for an innovation-friendly policy framework and Lorenzo Montanari and the Property Rights Initiative who keep updating their annual index and hence provide valuable data for the field of innovation-friendly policies.

**Abstract**

By 2020, for the first time in human history, there will be more people over the age of 64 than under the age of 5. This is mainly thanks to innovations in health, food, and biosciences. Consumers are the main benefactors of such innovation in society. Innovation and scientific breakthroughs provide the best and most sustainable solutions to the challenges that humanity faces, be it ecological or epidemiological problems. It is new technologies and innovative medical solutions that will help to tackle these challenges. And while consumers benefit from these and hence enjoy longer and better lives, more prosperity, and yet more choice on what to buy and what to consume, more voices are clamouring and advocating for policies that might endanger future scientific progress.

For many, intellectual property rights are an abstract concept that don’t fit into the worries of an average consumer, or as we will continue calling them from hereon, patients. The misconception that intellectual property such as patents only help large corporations enables the adoption of harmful anti-innovation policies.

Innovators and investors in research and development must be able to rely on the protection of intellectual property. While opponents seeking to relax or even abolish intellectual property rights in the European Union are correct that, in the very short term, it may lead to more accessibility of existing technologies, we must keep in mind that this comes at the expense of future innovations. Without safeguarding intellectual property, we are likely to end up in a technological stalemate where humanity stops progressing. Patients who may one day be diagnosed with incurable diseases such as Alzheimer’s, Cystic Fibrosis, Diabetes, or HIV/AIDS should benefit from the chance that a cure will become available, and protecting IP is the only way to give them that chance.

This policy paper analyses the current state of innovation in Europe and around the world and identifies the main drivers for continuous progress in innovation. As part of this analysis, the authors assess current attitudes towards intellectual property rights in Europe, and make the consumer case for strong intellectual property rights.

The author makes the case for several policy recommendations the European Commission and the European Parliament should follow:

- Ensuring the EU updates and maintains a world-class approval system of medicines that transparently communicates to patients and the public which drugs are available on the market and which will be available in the future.
- Safeguarding Intellectual Property Rights within the European Union and globally through the EU’s trade policy. Strong IP rights are necessary in order to foster innovation in Europe and allow for much needed scientific breakthroughs to take place, in order to cure diseases we still struggle to cure.
- A digital health infrastructure as part of the Digital Single Market that allows interoperability among eHealth systems and does not stifle the use of necessary data for medical research.

Only innovations will be able to truly tackle problems such as (yet) incurable diseases, fluctuations in global food supply, and coping with the potential effects of changes in local and world climate. Innovative breakthroughs are the only true method to help humanity overcome challenges without having to reduce the standard of living of everyday people. It is paramount for the European Union and its member states to provide a policy framework that fosters innovation as much as possible. The following chapters aim to show that intellectual property is a necessary foundation for the ability of a society to foster innovation.
The first two decades of the 21st century have already brought consumers a plethora of innovations that directly lead to longer and richer lives. Breakthroughs in internet and communication technologies, agriculture, mobility, and life sciences continue to transform our societies. Over the past twenty years, life expectancy has increased by a very impressive 5.5 years. The World Health Organization estimates that infant mortality fell by 80% from 160 per 1,000 live births in 1950 to 29.4 per 1,000 live births in 2017. Rising incomes resulted in better sanitation and nutrition. The success of the human papilloma virus (HPV) vaccines are showing traction in the area of cancer prevention. In the current era, 86% of infants worldwide are vaccinated against diphtheria-tetanus-pertussis (DTP), which has led to a 96% reduction of newborns dying of neonatal tetanus.¹

In October 2019, a Reuters story headlined “Paralysed man walks again with brain-controlled exoskeleton” described a 28-year-old tetraplegic patient who “used a system of sensors implanted near his brain to send messages to move all four of his paralysed limbs.”² His story should bring hope to millions of other people with mobility disabilities. Innovation in the life science and medical technology sector are undoubtedly improving people’s lives. And while these achievements are very laudable, one must keep in mind that there are still many challenges humanity needs to tackle. Changes in the climate, feeding a growing world population, and the rise of non-communicable diseases require new innovations. Looking at the World Health Organization’s Essential Medicines List (EML), a list of several hundred drugs critical to saving or improving patients’ lives, most of these drugs are results of years of research and investments conducted by pharmaceutical companies.³ It would not be surprising, if in a world without intellectual property rights such as patents, that such innovations would have never happened given the lack of incentive to invest large sums into the development of such drugs.

The History of Intellectual Property

While some critics claim that intellectual property is an invention of corporate exploitation, the opposite is actually the case. Intellectual property began as a self-regulating form of consumer and property protection. As a result of urbanization, people moved to larger cities and therefore didn’t have the certainty of quality they once did in their one-shop villages. Entrepreneurs filled that gap of trust by offering branded products consumers could be certain about. Business owners have a huge incentive to maintain the quality level of their branded products and protect their innovations – it’s the value of their brand. Companies utilize brands and intellectual property in order to build and retain customer loyalty.⁴

In developing countries, the arrival of foreign brands points to an increase in quality and

¹ http://www.who.int/news-room/fact-sheets/detail/tetanus
² http://news.trust.org/item/20191003220343-rj0zi
³ https://www.who.int/medicines/publications/essentialmedicines/en/
The campaign group Health Access International, on the contrary sees intellectual property rights as a reason for a lack of innovation. Groups like HAI and Oxfam complain about the absence of patient-centricity in the development of new drugs. “The absence of a widely accessible Ebola treatment and the prohibitively high price of new hepatitis C and cancer medicines should spark an urgent rethink on trade and R&D policies. Innovation must serve people’s needs and not those of the profit-driven pharmaceutical industry, as it is now. Fragile health systems in Europe and developing countries simply can’t afford skyrocketing medicine prices,” said Aliénor Devalière, a spokesperson at HAI. This criticism is especially confusing given the very quick response of the pharmaceutical industry to develop a cure for the Ebola virus.

Despite this ongoing criticism by activists, one must acknowledge that intellectual property provides consumers with product safety information, innovation, and product diversity at the same time. If they don’t provide value to customers, those brands would disappear. Strong intellectual property rights promote the rule of law and allow freedom of commerce. The massive improvements of the average human’s life in the past half century can be mainly attributed to innovations and wealth created by the private sector. This includes, for instance, the fact that food production since 1961 has grown by 400% while human population only grew by 250%. An attack on intellectual property is, therefore, a direct attack on the market economy and mutual voluntary exchange in the marketplace. Therefore, any regulatory infringements on intellectual property rights must be curbed in order to keep places like the European Union important strongholds of commerce and the rule of law.

How does innovation happen?

Developing a drug from scratch to a market-ready product that can save patients’ lives requires an average of nearly 2 billion Euros of private investments. Despite massive private sector investment and successes in the past, several EU member states and parts of the global public health community (including the WHO) have suggested additional interventions in limiting intellectual property rights of pharmaceutical innovators. There’s a growing belief that expenditures for research and development in medical research should come from the government and pharmaceutical manufacturers should only be reimbursed for their variable costs of producing a drug (plus an additional small markup). This concept is called delinkage and is strongly advocated by Southern European countries, such as Malta, Cyprus, and Greece, as well as the WHO. Innovation and scientific breakthroughs provide the best and most sustainable solutions to challenges humanity faces: be it ecological or epidemiological problems; new technologies and innovative medical solutions help to tackle these challenges.

Role of Intellectual Property in Innovation and New Product Development

In order to create an environment in which innovations can flourish, several preconditions are necessary. Access to capital is one precondition that is especially important for research-heavy industries and long product development. Patents can play a crucial role in helping to get access to early stage and seed capital. Business angels and venture capitalists are usually only interested in investing in an idea or research project if this can be also marketed and protected during commercialisation. The inventor on the other side can be assured that he can share his research with potential investors if he has already patented it but needs further funds to reach a market-ready product. The patent also allows the inventor to keep ownership of the innovation until he or she has secured funding for mass manufacturing, trials, or refining the process.

A good example is the invention of the electro-photography machine by Mr. Chester Carlson. He patented his machine in 1939 but needed another eight years to secure the necessary capital to mass manufacture the first copying machine in the world. In previous chapters we already addressed the general trend that innovation has brought many improvements to humans. The last decades provided an especially strong transformation. The graphic below shows the massive improvements of life expectancy, infant mortality and gross domestic product per capita for two EU citizens that have been both born in 1987 in Poland and Spain. Just three decades innovation and economic growth have resulted in massive gains in quality of life.

Innovation requires not only massive investments, but also time and the ability to experiment through trial and error. This can be
seen in the fact that on average, only one of every 5,000-10,000 substances synthesised in research facilities will make it successfully through all stages of product development to become an approved drug. Many projects and even entire biotech companies fail to bring even one product to the commercial stage. Investing in life sciences requires a very healthy appetite for risk, and hence an incentive scheme that rewards those able to create value with their inventions is required.

By the time a medical drug reaches the regular patient, an average of 12.5 years will have elapsed since the first discovery of the new active substance. The total investments needed to get to one active substance that can be accessed by a patient is around two billion Euros.¹²

<table>
<thead>
<tr>
<th>Country</th>
<th>Life expectancy at birth, years</th>
<th>Infant mortality rate per 1,000 live births</th>
<th>GDP, per person 2018 U.S. dollars</th>
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From Alzheimer’s to Zika: Let’s find cures and not halt medical innovation

Innovators and investors in R&D should be able to rely on the protection of IP. While voices calling for softening or even abolishing IP in the EU might be right that, in the very short term, it might lead to more accessibility of existing technologies, we need to keep in mind that this jeopardizes future innovation.

Innovation and scientific breakthroughs provide the best and most sustainable solutions to the challenges humanity faces: be it ecological or epidemiological problems; new technologies and innovative medical solutions help to tackle these challenges. Without safeguarding IP, we may end up technologically stagnant, a dire situation where humanity stops progressing. Worldwide, there are over 7,000 new medicines currently in development. Currently over 1,800 oncology medicines are in development. There are 500 drugs for mental health disorders, and nearly 1,400 for neurological disorders. Over 1,200 medicines are in development to fight infectious diseases, 600 to manage cardiovascular disorders, 475 for Diabetes Type I and II and 1,120 for immune disorders.¹³ Patients who are diagnosed with a currently incurable disease, such as Alzheimer’s, Cystic Fibrosis, Diabetes, or HIV/AIDS, deserve the chance of eventually benefitting from a cure. There have been some remarkable developments in the past two decades. Just 20 years ago, being diagnosed with HIV/AIDS was once a quick death sentence. While HIV has yet to be cured, modern medicine managed to reduce its severity from a death sentence to a chronic disease.

The most common cancer in children and teens, childhood leukemia, is now treatable with survival rates at 90%.¹⁴ Hypertension and diabetes are treatable these days but still lack a proper cure.¹⁵ Encouraging breakthroughs and media reports about new medical inventions such as a liver being fully grown in a lab should make society hopeful that many of the thousands of diseases that can’t yet be cured or treated, will eventually be curable.¹⁶ In order to shorten and even eliminate lists such as the one shown below, a smart regulatory approach towards innovation and science is needed by which incentives for innovators and investors in innovation are provided.

12 DiMasi et al., Journal of Health Economics, January 2016
14 https://www.webmd.com/cancer/lymphoma/childhood-leukemia-symptoms-treatments#1
15 https://www.healthwriterhub.com/cure-or-treatment-whats-the-difference/
Some remarkable innovations have helped to cure, or at least treat, many diseases. In 2001, an HIV-patient had to take 16 pills twice a day. The same treatment is now possible with just one pill daily. Viruses such as Ebola, Marburg, or Lassa are often reported as killer viruses that might wipe out humanity and still lack a solid cure. Some positive recent developments in the field of treating and even curing Ebola can be seen in promising treatments developed by companies such as Regeneron or Gilead Sciences. In October 2019 the European Medicines Agency’s Committee for Medicinal Products for Human Use (CHMP) recommended conditional marketing authorization for a new Ebola vaccine. Merck’s vaccine Ervebo for adults over the age of 18 who are at risk of contracting Ebola has been recommended to the European Commission for approval. EMA Executive Director Guido Rasi said that the decision “is the result of many years of collaborative global efforts. This is an important step towards relieving the burden of this deadly disease.”

And while it is important to take these viruses and their lethal potential extremely seriously, there are also much more ‘common’ viruses that are responsible for many more deaths per year. One of the most lethal viruses in Western countries is the common flu that mutates regularly, causing 200 million hospitalisations a year, and differing levels of severity depending on one’s immune system. Between 15,000 and 70,000 European citizens die every year due to causes associated with influenza.17

Patient Need

Some incurable Diseases and their Prevalence in the European Union 28

<table>
<thead>
<tr>
<th>Disease name</th>
<th>Prevalence EU28</th>
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<tbody>
<tr>
<td>Alzheimer’s</td>
<td>5,500,000</td>
</tr>
<tr>
<td>Cystic Fibrosis</td>
<td>Approximately 45,000 patients in EU 19</td>
</tr>
<tr>
<td>Diabetes</td>
<td>33,000,000</td>
</tr>
<tr>
<td>Parkinson’s disease</td>
<td>1,200,000 20</td>
</tr>
<tr>
<td>Crohn’s disease</td>
<td>1,100,000 21</td>
</tr>
<tr>
<td>Celiac disease</td>
<td>4,000,000 22</td>
</tr>
<tr>
<td>Fibromyalgia</td>
<td>14,000,000 23</td>
</tr>
<tr>
<td>Hepatitis B (chronic)</td>
<td>3,900,000 24</td>
</tr>
<tr>
<td>Irritable bowel syndrome</td>
<td>Approximately 40,000,000 25</td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td>2,000,000 26</td>
</tr>
<tr>
<td>Psoriasis</td>
<td>8,000,000 27</td>
</tr>
</tbody>
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20 https://www.braincouncil.eu/library/disease-fact-sheets/parkinsons-disease/
23 https://www.eutfs-europe.eu/declaration/
26 https://apps.who.int/iris/bitstream/handle/10665/204417/9789241565189_eng.pdf. psoriasis;jsessionid=54912784D28CF36ECC2454747A375758?sequence=1
28 https://apps.who.int/iris/bitstream/handle/10665/204417/9789241565189_eng.pdf. psoriasis;jsessionid=54912784D28CF36ECC2454747A375758?sequence=1
While trade is important for the wealth of an economy, this reduction of SPC protection may lead to a further erosion of IP in the European Union and in emerging markets (which easily can point to the EU when emulating similar policies) and ultimately reduce the innovation potential of our society.

Foreign pharmaceutical companies in China are facing more and more invalidations of their intellectual property. This is mainly caused by actors exploiting China’s burdensome bureaucracy and opaque regulations to attack the validity of a patent that has been filed for in the past. These practices are a dangerous precedent for patients in China, as such behavior could lead to innovative pharmaceutical companies leaving the country entirely.29

The regulation and access to medicines in Europe is partially regulated by the EU and partially by Member States. To understand this better, it’s important to distinguish between mere market authorization, which allows a drug manufacturer to sell a product in a country, and pricing and reimbursement decisions which determine the price of the drug and whether public health insurance covers it.

Market access decisions are either made by the EU or at least regulated uniformly. While the European Medicines Agency (EMA) is currently occupied with moving from London to Amsterdam, it also has a central role in the medicines approval system within the EU, Iceland, Liechtenstein, and Norway. If a pharmaceutical company seeks marketing authorization for an innovative drug in just one EU Member State, it usually must apply centrally at the EMA for marketing authorization. Generics and other medicines can be approved by national medicines agencies through either a decentralized method or by mutual recognition of existing marketing approvals in other Member States.

The new European Parliament and Commission will be tasked with how to reemphasize innovation in order to drive scientific progress towards curing (or at least being able to treat) more and more diseases. The following policy recommendations would help to foster innovation in the EU:

- Regulators and policy makers need to ensure that the EU updates and maintains a world-class approval system of medicines. Innovators and applicants for intellectual property should have clear and short timelines when trying to secure their innovation and thus be able to market it. The early certainty initiative of the European Patent Office can be seen as one initiative that helps making the registration and approval of intellectual property more streamlined and hence brings innovation quicker to the consumer.34
- Patient-friendly transparency and open government are needed in many countries that still fail to have an easy database for patients to access that lists all approved drugs and drugs that are currently undergoing market authorization in the respective country. An example is the U.S. FDA’s database.35 Patients deserve better and complimentary access to such information. This information can also help practitioners to design better treatment plans.

The EU’s population account for less than 7% of the world population but its gross domestic product (GDP) accounts for nearly 17% of the global GDP and 22% of global pharmaceutical sales.29 Several regulatory steps and policy actions can be undertaken in order to ensure that European patients get access to the latest trends in medical innovation. At the same time, one must keep in mind that five out of ten of the world’s largest innovative pharmaceutical companies are based in Europe. And while some of them are not headquartered in the European Union, they tend to have extensive research and development facilities in the EU28 member states. The Global Innovation Policy Center’s IP Index lists 6 EU member states in the ten-highest ranked countries for intellectual property rights.30 This is encouraging given the fact that countries with strong intellectual property rights are 55% more likely to quickly adapt state of the art technologies, and even 19 times more likely to attract early phase clinical trials.

But recently new laws and regulations by the European Union have attempted to erode intellectual property rights. The move to reduce exclusivity rights of so-called supplementary protection certificates (SPC) was a clear step of European policy makers to deprioritize future innovation and emphasize supporting exports of generic drugs to other parts of the world.29 A vast majority of MEPs voted in favor of softening intellectual property rights in the European Union.32 The lawmakers had the noble goal of boosting the competitiveness of the European generics manufacturing sites but in the long run there could be an impact this will have on finding cures and treatments for diseases we haven’t yet been able to cure.

The law to soften the SPC situation was already the result of a larger push by the ECR Group at the European Parliament. The ECR Law was based on the work of the ECR’s research team on global IP trends and the then ECR President’s position paper on IP. But the ambitions of the new law and regulations in the EU were further pushed by the new EPP (European People’s Party) Commission which is headquartered in Brussels. The EPP is the largest political group in the European Parliament and they had been working closely with the ECR Group to push for the new IP law.

The EPP is currently the largest political group in the European Parliament but they are also currently facing a leadership crisis. The German Commissioner for the Environment, Economics and Energy is the only member of the EPP Group not standing for re-election in the new Parliament. The EPP’s leader will also move from Brussels to Paris.33

The move to reduce exclusivity rights of SPCs in the EU has several negative consequences. First, it will reduce the time frame for drug developers to recoup the investments they have made. This is especially important for biopharmaceuticals which are more and more the drugs of the future due to the ever increasing number of orphan diseases.32

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• Regulators should incentivise innovation by keeping the European Union in the leading group of defenders of intellectual property. Half of the leading pharmaceutical innovative companies are based in Europe. Eroding the patent protection of innovations in Europe could lead to not only a reduction of innovation happening in Europe, but also significantly limit European patients’ access to such innovations. This can already be observed in the food and agricultural industry. EU consumers are, for instance, deprived of accessing breakthrough innovations such as the meatless Impossible Burger as it contains GMOs that are crucial for creating a taste similar to meat.36 Patient and consumer choice are enhanced in policy frameworks that foster innovation.37

• They must also safeguard intellectual property rights within the European Union and globally through the EU’s trade policy. In its bilateral trade negotiations with countries in South America and China, the EU should stress the importance of strong intellectual property rights. These are necessary in order to foster innovation in Europe and allow the direly needed scientific breakthroughs in order to cure diseases we still struggle to cure.

• Regulators could and should reduce red tape when it comes to testing and introducing drugs to the market. Shortening the time trials take would increase the time drugs are patent-protected and on the market. That would allow for a better price calculation, increased savings per treatment, and the latest drugs for those who need them most. The recently intensified collaboration between the EMA and FDA is a good step in the direction of mutual recognition of drug approval authorities on both sides of the Atlantic. This would incentivise European authorities and the FDA to spend less on reviews and speed up the time patients in both regions can have faster access to needed medicine, a regulatory “race to the top”. Patients would be able to choose the best of both worlds: No matter if the FDA or EMA approved a drug first, European and American patients would immediately have access to it. There is no reason to deprive European and American patients of drugs that have been approved by either regulatory authority.

• Another important area where we still need improvements is to allow more patients to have access to potentially life-saving drugs that have not yet been approved by regulators. This is called compassionate use. One of these programs was recently approved in the United States, called Right to Try. A terminally ill patient should have the right to try experimental (and potential unsafe) medicine if there’s a chance that this drug would save his or her life.38

• A digital health infrastructure as part of the digital single market that allows interoperability among eHealth systems and does not stifle the use of necessary data for medical research.

ft-cited figures reveal that innovative pharmaceutical companies make over 50% of their global profits in the United States.39 This has historically allowed Europe to have lower drug prices in comparison to the US. However, the current aggressive moves to bring drug prices even further down in several EU countries, such as Cyprus and Greece, may severely harm the future pipeline for innovation in Europe. Patients are, of course, interested in cost control, but also favor new drugs that are able to cure diseases medicine currently can’t treat. Many politicians—for example the Italian Minister of Health Roberto Speranza, the Italian government coalition, the 5 Stars Movement and Free and Equal (LuE) party40 and the former Greek government of Tsipras—evoke the populist message of cutting profits for pharmaceutical companies. This sounds tempting to voters at first but is likely to jeopardize future scientific breakthroughs and drug accessibility. And that would be a problem for patients.

Headwinds for Innovation from Policy-Makers

While the support of the introduction of SPC waivers was based on rather shortsighted industrial policy considerations, we can also observe much more populist rhetoric in the field of innovation policy. The United Kingdom’s Labour Party pledged at its 2019 party conference in Brighton, UK to offer the latest drugs through the National Health Service of England by de facto breaking patents. Labour’s leader Jeremy Corbyn said during this party conference:

“Labour has pledged to create a publicly-owned company to make cheap versions of medicines the NHS needs but cannot afford, such as Orkambi, which is denied to thousands of children and young people with life-shortening cystic fibrosis. ...

It says the UK should follow the examples of Argentina, Brazil and India, which already challenge patents and make affordable versions of some medicines in the public interest.”41

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38 https://consumerchoicecenter.org/rejection-of-right-to-try-bill-is-cruel-and-inhumane/
The leader of a major political party in the United Kingdom applauds the innovation policies of countries such as Argentina and India, which historically have a bad track record of safeguarding property rights and have poor performance when it comes to pharmaceutical innovation. In the 2019 Intellectual Property Rights Index, the United Kingdom still ranks seventh globally, but the policies endorsed by Mr. Corbyn are in countries such as Argentina which ranks 88th, India which ranks 49th, and Brazil which 38th among 129 countries.42

The Dutch Minister of Health, Bruno Bruins, suggested, after his inauguration, to change the rules of the game, and to tackle what he calls “absurd” medicines pricing. He informed the Dutch parliament that he plans to extensively explore the use of compulsory licensing of patents of medicines that are (in his view) too expensive. In 2019 he authored an open letter to the pharmaceutical and biotech industry doubling down on his pressure towards relaxed patent protection:

“Last week two reports in the media caught my attention. The good news: two vital new cancer drugs are now covered by basic healthcare insurance. The bad news: healthcare is becoming unaffordable for more and more people in the Netherlands. These two news items aptly illustrate the healthcare dilemma facing not only the Netherlands but many countries: yes, we’re delighted with new therapies (in our view) too expensive. In 2019 he authored an open letter to the pharmaceutical and biotech industry doubling down on his pressure towards relaxed patent protection:

The EU Commissioner for Health between 2014 and 2019, Vytenis Andriukaitis, was one of the leading voices behind the SPC waiver allowing generics manufacturers to produce and export drugs that are still under patent protection within the EU. On this topic he neglected the importance of patents for innovation and said:

“It’s not true that it damages innovation. We have the health technology assessment to help us have innovation in our hands. It’s about possibilities to allow small and medium enterprises to produce generics and sell them to the market. Of course, who likes to have more competitors?”44

A study commissioned by the US Chamber of Commerce stated at the same time that this new policy will cause between 4,500 and 7,700 direct job losses (with an additional 19,000-32,000 indirect job losses) and a decrease in research and development investment of between 215 and 364 million Euros.47

Bruins continues asking pharmaceutical companies to “take on social responsibilities”. A later chapter of this paper will look at that responsibility and what the industry has been doing beyond providing patients with innovative drugs but also allowing patients access. The Netherlands still ranks in the top six countries of the Intellectual Property Rights Index but risks dropping many ranks if introducing compulsory licensing becomes the reality.

But it is not only politicians in member states of the European Union, such as the former Italian Minister of Health Giulia Grillo45, the Italian Minister of Foreign Affairs Luigi Di Maio,46 or the former Lithuanian Health Minister Aurelijus Vergyš that want to reduce and limit rights to own patents. Members of the European Parliament also have repeatedly challenged the EU’s leading role in the protection of intellectual property rights and thus neglected how important patents are for innovation.

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“The prices of new medicines have increased during the past decades to the point of sometimes being unaffordable for many European citizens, limiting their “right to benefit from medical treatment” as stated in the Charter of Fundamental Rights of the EU. The entry of generics and biosimilar onto the EU market is important for reducing prices, ensuring sustainability of healthcare systems, whilst also having a positive effect on national health budgets. The faster entry into the EU market gives Europeans access to new and safer medicines. The introduction of the SPC Manufacturing Waiver helps to reduce barriers to access to medicines, including shortages of essential and other medicines. Producing within the EU can lead to enhanced security and quality of supply, reduced counterfeits and uncertainty due to import reliance. Introducing the manufacturing and stockpiling waiver will also strengthen the generics and biosimilar sector in Europe, and reinforce the EU’s position as a hub for pharmaceutical innovation and manufacture, especially in the field of biosimilars, creating jobs and ensuring expertise remains within the Union.”46

A group of roughly two dozen Members of the European Parliament from predominantly leftist parties, issued a letter to Trade Commissioner Malmström in November 2017 heavily criticizing the inclusion of intellectual property provisions in trade deals such as the EU-Mercosur trade agreement:

“We cannot ignore the negative effects of much more stringent Intellectual Property Rights provisions on affordable health in the Mercosur countries. Furthermore, entering into agreements with third parties on these provisions, the EU is effectively locking in these provisions, ignoring the concerns expressed by the EU’s own Member States, and effectively undermining potential efforts by its Member States to revise the pharmaceutical systems in order to ensure affordable access for their populations and to guarantee the sustainability of our health systems.”46

The former socialist Irish MEP Nessa Childers, pushed for more lax handling of intellectual property rights and reducing their role in trade agreements at an event in Brussels in late 2018 “An important message we need to heed is that we must reverse course on Trade-Related Aspects of Intellectual Property Rights, to fully implement and promote the flexibilities and safeguards allowed under trade law.”45

Overall, these examples show that a strong legislation in favor of innovation and intellectual property is not among the top priorities of some policymakers. The next chapter will show some positive developments, highlighting policymakers that stand up and advocate for innovation. These two parallel developments suggest that there’s currently a polarization in public policy making on both the anti-IP front and the pro-innovation advocates.
NGOs against future patients

The push against innovation doesn’t end with the aforementioned populist policy makers. Civil society groups and NGOs have joined this push that will ultimately go against the interest of patients and those who do not want to halt medical progress. The non-governmental organization Oxfam regularly criticizes the European Union’s intellectual property framework for being too strict. In one publication Oxfam attacked the EU’s trade policy and alleging that it has a ‘damaging impact on medicines’:

“The competence to formulate and implement EU trade policy, including external IP policy, is delegated to the EC on behalf of EU Member states. In its trade agenda, the EU has focused on extending monopoly protection for patented medicines, using FTAs and bilateral pressure. In its defence, the EC mentions its adherence to the TRIPS flexibility according to the WTO Doha Declaration on TRIPS and Public Health, as well as tiered-pricing policies to improve access to medicines in developing countries. Yet, its reference to the Doha Declaration is often an empty gesture, given that it does not supersede parallel efforts to impose more stringent TRIPS-plus rules upon developing countries that conflict with the spirit and intent of the Doha Declaration. Furthermore, tiered pricing has only been modestly used by pharmaceutical companies. In practice, tiered pricing is demonstrably less reliable and less effective than generic competition in sustainably achieving affordable prices for quality medicines.”

The authors of this paper by Oxfam fall short of making an actual consumer case against intellectual property laws by saying that the pharmaceutical industry has a bad research track record using the common phrase ‘innovation crisis’ and alleging pharmaceutical companies to produce so-called me-too drugs (drugs that contain similar ingredients) on purpose. However, what they omit is that research project in pharmaceutical companies rarely start with the goal to end up with an active substance that merely treats a disease equally well as an already approved substance. An observation of a longer time span of drug approvals by three authors published in the British Medical Journal has proven that there’s no clear trend towards less innovation in pharmaceutical research but rather a gradual increase of medical innovations since the 1970’s. The campaign group Corporate Europe Observatory recently released a report on why intellectual property rights are too strict in Europe:

“Don’t let Big Pharma’s fear-mongering narrow the scope for transformative change: With its exaggerated ‘sky-is-falling’ message and emotional PR campaigns, Big Pharma’s lobbying against the SPC manufacturing waiver aimed to narrow the scope for greater change. As further aspects of the IP and regulatory incentives regime – such as the orphan drugs regulation – come under closer scrutiny, this may only be a taste of things to come. Policymakers and parliamentarians should not let these scaremongering tactics close down broader debate, because the regime Big Pharma is trying to protect has led to a crisis of high prices, leaving patients without access to medicines they need, whilst more and more ‘new’ drugs have little-to-no added value, and vital but less profitable areas of research are neglected. Big Pharma’s attempts to deflect criticism and reinforce this regime come at the expense (literally) of patients’ access to medicines.”

The three examples from above showcase how often anti-corporate sentiments and the (justifiable) dissatisfaction with the status quo of unmet patient needs are being instrumentalized against intellectual property. Most of this criticism falls short of making an actual consumer case against intellectual property, nor does it offer viable alternatives on how to foster innovation in a system in which intellectual property plays only a marginal role.

53 https://msfaccess.org/6-things-big-pharma-doesnt-want-you-know/
54 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3585972/
It seems to me that there is a need for an overarching, coherent position from the Commission on intellectual property rather than what appears to be a rather piecemeal approach, looking at one piece of the jigsaw at a time.

(…) This brings into play another important issue which is the underlying global competitiveness that Europe has in pharmaceuticals. And the evidence that we have seen suggests that Europe’s global position is stronger in innovative pharmaceuticals than it is in generic pharmaceuticals. That is the risk if we proceed without a proper understanding of the dynamics of the marketplace.”

The Slovak MEP and member of the European Parliament’s Internal Market and Consumer Committee, Ivan Štefanec MEP, stressed the importance of innovation and intellectual property at a speech:

“When we talk about the development of economy particularly in the European Union, we have to take into account that we have to constantly protect ownership. It was much easier in the past to protect land, assets, however it is more challenging to protect new innovative ideas. Just for instance 150 000 new ideas are turned into patents yearly around the world and one third of it is coming from SMEs. In fact, that’s not much and I believe we can do better than that. […] Let me emphasise – the main target here is to get the same approach, the common European Approach for all the areas of the European Single Market. I have to admit we still don’t use the full potential of our Single Market and that is the point which is applicable in the area of patents as it is a costly procedure, it is extremely fragmented, therefore I do believe that the new approach of the unitary patents is a step forward and is particularly useful for small and medium entrepreneurs. With that we do not only achieve the simplification of the process overall, but time and cost saving – as SMEs often simply do not have enough time to get the information, so you can see my point. We live in the time of Information Revolution which changes our attitude in policy making, business making, therefore the discussion is crucial for our common economical wellbeing.”

The former Austrian conservative MEP Dr. Paul Rubig stated at a conference in 2018 his support for intellectual property rights:

“We all know that SMEs need a good understanding for issues related with innovation, new ideas or new products. It is highly important to protect SMEs in their capacity to get a return of investments. If an SME gets a good idea, makes a research, if it finds something unique the role of Patents Office is to check if it’s really new or if it does have enough potential to get intellectual property rights[…] I believe that one of the issues in this topic, especially for the SMEs is how to pay the wages, the office etc., so the money has to come in to run the business and to create jobs.”

The current Co-Chairman of the ECR Group at the European Parliament, Raffaele Fitto MEP, said on their huge development costs. A substantial portion of the revenues achieved from the sale of those innovative drugs are dedicated to fund new projects, and enable the pursuit of path-breaking R&D in the first place.

Unfortunately, regulatory hurdles often slow this already lengthy development process. Extensive clinical trials and testing can delay researchers from introducing products to a commercial market by several years.”

Adrian Towse is the director of the Office of Health Economics in the UK and a visiting professor at the London School of Economics. He stressed in an interview that the EU is gambling with its innovative potential when introducing policies such as the SPC Waiver:

“I think one would want to consider all the issues together in the context of the broader IP environment. The Commission has looked at other aspects of SPC protection, but I am not sure when the Copenhagen Economics report is due.

*Patents and other intellectual property protections enshrine the incentives that compel drug companies to take such extraordinary risks. By temporarily barring copycat products, the rules give innovators an opportunity to try and recoup

The former Czech Prime Minister, Jan Fischer, endorsed his support for innovation and outlined the significance of intellectual property. He calls drug development one of the riskiest ventures on the planet and hence argues for patent protection:

*“When we talk about the development of economy particularly in the European Union, we have to take into account that we have to constantly protect ownership. It was much easier in the past to protect land, assets, however it is more challenging to protect new innovative ideas. Just for instance 150 000 new ideas are turned into patents yearly around the world and one third of it is coming from SMEs. In fact, that’s not much and I believe we can do better than that. […] Let me emphasise – the main target here is to get the same approach, the common European Approach for all the areas of the European Single Market. I have to admit we still don’t use the full potential of our Single Market and that is the point which is applicable in the area of patents as it is a costly procedure, it is extremely fragmented, therefore I do believe that the new approach of the unitary patents is a step forward and is particularly useful for small and medium entrepreneurs. With that we do not only achieve the simplification of the process overall, but time and cost saving – as SMEs often simply do not have enough time to get the information, so you can see my point. We live in the time of Information Revolution which changes our attitude in policy making, business making, therefore the discussion is crucial for our common economical wellbeing.”

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56 https://www.euractiv.com/section/health-consumers/opinion/the-european-commission-should-shelve-its-patent-law-proposal/
September 23th during an event in Abruzzo (Italy): “Pharmaceutical medication has added 6 hours per day to our lives [...] Pharmaceutical companies from Europe are excellent at the global level, they produce not just products, but innovation, scientific research, and jobs, we need to growth and defend this leadership.”

Stefano Mauullu, former ECR MEP from Italy, said “Speaking of innovation means opening a fundamental chapter for the future of Italy and Europe. We talk about it a lot, about innovation, and sometimes we risk getting lost in a boundless universe of objectives that are not concrete. First and foremost, innovation is a challenge that is won when you have the ability to see beyond, to anticipate, to understand the future, transforming potential into opportunities. It is a challenge that to find the concreteness mentioned above must pass through people, people who know how to focus in fact on the necessary path to face it and win it, and a strong IP infrastructure will allow this to happen.”

Amaryllis Verhoeven is Head of Unit, Industrial Property and the Fight against Counterfeiting at DG GROWTH. She said in a statement: “The mission of our team is to ensure that the single market and EU industry can benefit from a world class, up-to-date, and transparent IP regulatory framework that enables new startups and existing companies to valorize, invest in, and exploit their IP assets across Europe, thus stimulating innovation. We want to make sure that ideas can be turned into jobs and growth, to the benefit of all.”

This growing group of policy makers and regulators have identified intellectual property as a necessary precondition for ongoing and accelerating innovation. The next chapter will some encouraging developments and recently approved drugs that improve millions of patients’ lives.

A good example of the importance of the private sector in developing and bringing drugs to the market is the story of Harvard Professor Dr. Jeffrey Karp. He initially failed to raise venture capital for his promising research in modifying stem cells to treat ulcers. According to him, his developed treatment methods were just too complicated to mass manufacture and market. This feedback from potential investors drew him back to the drawing board and he radically simplified the process in order to be eligible for venture capital and to start his own biotech venture. Without knowing that the inventions of this biotech startup would be able to be monetized afterwards, it is hard to believe that any venture capitalist would provide funding for bold and risky ideas. The existence of patents allows entrepreneurs, especially founders of small companies, to compete with large and established institutions and corporations with large research departments and budgets.

Another example is Mandy Haberman, the inventor of the revolutionary anywaycup, an easy drinking device for infants. She said that intellectual property is the backbone of her successful business that has sold over 40 million pieces. Without patenting her idea, she would have had no incentive to look for larger distribution partners that could get her listed in retail markets. Licensing of that IP allows founders of businesses to export their inventions quickly to consumers all over the world. Ms Haberman’s impact on the nursing industry led to her to be recognized by Her Majesty Queen Elizabeth II of the United Kingdom as a “Pioneer to the Life of the Nation.”

These are encouraging examples of how innovation is driven by intellectual property and very much needed, as there are still many problems to tackle for inventors. There are over 10,000 known diseases in the world but approved treatment for merely 500 of these. While the majority of patients will not be diagnosed with rare orphan diseases.
that in most cases still await a cure, many common diseases still cannot be cured. And while phar-
maceutical companies increase their investments in research and development, many experts saw productivity in the lab plummeting in the past year, as the industry switched its attention from mainly focusing on diseases that are relatively common and easy to treat to those that are much more complex or unusual. Making research more data-driven and virtual can help accelerate much more complicated research ventures that aim to find treatments for small patient populations. The use of health data and respective regulations around data are often a hurdle for the effective use of health data that could get critical drugs developed much faster.

In 2018, the FDA’s Center for Drug Evaluation and Research (CDER) approved 59 novel drugs, breaking its record of 53 approved drugs in 1996. This high approval rate follows a few fruitful years for drug developers. The FDA’s 5-year annual average is now 43 drugs per year, nearly twice its lowest point in 2009. And there is also good news from Europe as the European Medicines Agency authorized 42 new active substances in 2018. That represents a 50% increase from the relatively low 27 active substances approved in 2016. Some of the very promising approvals are listed below:

- **Cancer:** Kymrijh and Yescarta are the first two chimeric antigen receptor (CAR) T-cell therapies in the EU intended for the treatment of certain blood cancers. Kymrijh and Yescarta are also the first medicines supported through EMA’s PRIME (priority approval) scheme that received a positive opinion from the Committee for Medicinal Products for Human Use.

- **Blindness:** Luxturna, for the treatment of adults and children with inherited retinal dystrophy caused by RPE65 gene mutations, a rare genetic disorder which causes vision loss and usually leads to blindness.

- **Epilepsy:** Kigabeq, a new paediatric-use marketing authorisation (PUMA) for the treatment of infantile spasms (West’s syndrome) and resistant partial epilepsy.

- **Insomnia:** Slennyto, a new PUMA for the treatment of insomnia in children and adolescents with autism spectrum disorder or Smith-Magenis syndrome.

- **Diabetes:** Anglida, for the treatment of diabetes mellitus in newborns, infants and children.

- **Lysosomal storage disorder:** Lamzede, long-term enzyme replacement therapy in adults, adolescents and children with mild to moderate forms of alpha-mannosidosis.

- **Hunter syndrome:** Mepsevii, for the treatment of mucopolysaccharidosis type VII.

- **Myotonia:** Namuscla, for the treatment of myotonia in adult patients with non-dystrophic myotonic disorders. This is the first treatment for this disease to be authorised EU-wide.67

### Ethical Considerations

While activist groups such as Oxfam or Corporate Europe Observatory argue against the model of for-profit pharmaceutical companies. One must recognize that most of these firms are well-known for philanthropic activities in low and middle income countries, as well as for different strategies advancing patient access in these countries.

Tiered pricing: Pharmaceutical companies usually adjust the price of their drugs to the average purchase cost of patients or the GDP per capita. The British company GlaxoSmithKline usually caps their drug prices in emerging markets at 25% of the price they ask for in developed countries. In many cases the price is way below the 25% cap. The same company offers their HIV/AIDS medicines at merely variable costs to patients in South Africa.

Malaria remains responsible for over 400,000 deaths a year worldwide. This number was nearly twice as high two decades ago, but due to the development of new treatments and the philanthropic support of foundations and the pharmaceutical industry, more and more patients receive the treatment they need. Since 2001 the Swiss company Novartis supplies the fixed-dose artemisinin-based combination therapy (ACT) without profit to public-sector buyers. Over 850 million antimalarial treatments have been delivered to patients in more than 60 malaria-endemic countries.68

The American pharmaceutical company Johnson & Johnson and South African President’s Emergency Plan for AIDS Relief, have entered into a public-private partnership with the nonprofit HealthEnabler to fund the scaling up of digital health tools to support elimination of mother-to-child transmission of HIV programs in both countries. The Swiss company Roche created the so-called Global Access Program in 2014. It gives patients access to HIV viral load tests. This has helped to improve early infant diagnosis in the 82 countries with the highest disease burden. In 2019, the Global Access Program included a full portfolio with access to molecular diagnostics for HIV, Hepatitis B and C, and Human Papillomavirus. Four years after its rollout, the number of HIV tests run was more than four times higher than when the programme was kicked off. Better diagnosis usually results in earlier treatment options for patients. A challenge many of these programs face is the lack of healthcare infrastructure in developing countries. This can range from cooling chains for the safe transport of vaccines to distribution channels or even just the existence of decent roads. A lot of supplied drugs are just sitting in warehouses due to the barriers to getting them to patients in need.68

One can conclude that most pharmaceutical companies are not exploiting their monopolies on patents but are instead providing patients in low- and middle-income countries with access to medicine. Especially in low- and middle-income countries, these companies show significant social responsibilities. A plethora of support programs in-house aim to help patients to gain access to medicine.
How to tackle costs for Medicines and Innovation

Many opponents of intellectual property rights have rightfully pointed out that drug prices have been increasing over the last decades. Access for patients in low- and middle-income countries is a huge problem. Not just medical but also other innovations often make it only very late to emerging markets and are sometimes even more expensive than in developed countries. While patents are often being made responsibly for the lower access to medicines in low- and middle-income countries a plethora of other factors play into the low availability and affordability issues of innovative and also generic medicine in such countries.

Tariffs: While many WTO countries have signed the WTO Pharmaceutical Tariff Elimination Agreement (also called Zero for Zero initiative), that lists over 10,000 active substances and products, many other countries still impose import and export tariffs on pharmaceuticals. Nepal imposes nearly 15% import tariffs on pharmaceuticals while Pakistan and India charge over 10% on imported drugs. A joint statement of the Geneva Network and its partners suggested that non-WTO countries should just unilaterally abolish import tariffs on drugs.

Emerging markets have often ever higher taxes, duties, and government fees on drugs. Besides VAT rates of up to 25%, other markups on the initial import price can reach a total price increase of 200-300% in countries such as Brazil or Kenya. Other examples of artificially disrupting global supply chains can be seen in governments only procuring drugs manufactured in their own country. The Russian Federation is the primary example and it has implemented a strategy which aims to reduce drug imports to 50% of total drug sales in Russia.

An additional problem in many emerging markets is the delay of approvals compared to regulators in Europe or the United States. It can often take 5 to 8 years longer for a drug being available compared to developed countries. This is mainly due to bureaucracy. The above-mentioned lack of medical infrastructure in Africa is another significant inhibitor of better patient access to needed medicines. Developing countries should accept drug approval decisions from established regulators such as the FDA or EMA. The Republic of Georgia is a good example of a country that recognizes approval decisions of developed countries.

Long approval processes and prospective reimbursement lists limit consumer and patient choice and access to innovative treatments. More and more governments of EU member states – for example, Slovenia, Malta, Greece, Ireland, Portugal, and Italy – aim to reduce procurement costs for innovative drugs by merging their drug purchasing and price negotiation efforts. This could lead to lower public expenditures on costly drugs as it also opens the floodgates of rationing innovative medicine. A harmonised and merged purchasing system could lead to the lowest common denominator when it comes to reimbursing innovative medicines. This could come at the expense of patients looking for innovative treatments.

The utilization of more data and streamlined approval processes, thanks to the smart use of machine learning and simulations in early trial phases, might allow faster approval times. This would bring new treatments sooner to patients and at the same time increase the timespan a manufacturer can commercialize their patent. This de-facto increase of patent protection would still not change the year patients can access the generic but positively reduce the price per patient or dose due to the longer commercialization period.

It is also important to acknowledge that most European countries’ public finances don’t allow for larger public healthcare spending or at least a significant investment, the United Kingdom has already discussed during the failed TTIP talks. The next European Commission should pick up these conversations and push for mutually recognizing market approvals of the FDA and EMA. This would put both regulators under competitive pressure and put patients on both sides of the Atlantic on a level playing field when it comes to access to medicines.

The European Union’s member states rank in the first third of the Intellectual Property Rights Index of the Property Rights Alliance. While this is a good position, it is worth noting that NAFTA and EFTA members have better scoring in the index than the European Union.

Brexit: Through strong research expertise and significant investment, the United Kingdom has established itself as a worldwide leader in pharmaceutical innovation, and has attained a leading role in the European and global pharmaceutical supply chain. We are confident that there will be no additional trade barriers for pharmaceuticals and medical supplies between the United Kingdom and the European Union after Brexit. Since the EU has signed the WTO’s Pharmaceutical Tariff Elimination Agreement and this agreement is extended on a Most-Favoured Nation (MFN) basis, there should be no tariffs on most pharmaceuti
cals. An even more comprehensive agreement on waiving trade barriers for life science products and other innovations as part of an EU-UK free trade deal will be important for consumers and patients in both the UK and EU.

Research collaboration and supply chains between the EU27 and the United Kingdom need to stay integrated and need to keep producing some of the world’s best innovations.

70 https://ustr.gov/issue-areas/industry-manufacturing/industry-initiatives/pharmaceuticals
72 IMS Institute for Healthcare Informatics (2014) “Understanding the pharmaceutical value chain”
76 https://publications.parliament.uk/pa/cm201719/cmselect/cmitscss/383/38305.htm
Conclusion

The innovative potential of Europe in the world economy is currently at a crossroads. Populists in Europe, like Tsipras in Greece, the Five Stars Movement in Italy or Podemos in Spain, and in emerging markets, have been hoping for short term gains by pushing for an ongoing erosion of intellectual property rights. Medical breakthroughs have shown society in the past decades a positive direction of being able to cure or at least treat many formerly lethal diseases. While this direction is encouraging one also needs to acknowledge that science is still far from being able to treat and cure all of the over 10,000 known diseases in the world. Additional societal challenges need to be tackled by finding innovative technological solutions on how to feed a growing world population and how to deal with the results of climate change. Only innovators will be able to really solve such problems and help humanity to overcome challenges without having to reduce the average standard of living. It will be paramount to provide an innovation policy framework that fosters innovation as much as possible. As shown in this paper and by many authors before, intellectual property is a necessary foundation for the ability of a society to keep innovating. Therefore, it is appropriate to repeat the most pressing policy measures European leaders and policy-makers should follow in order to allow for a framework that helps releasing the innovative spirit that allows to come up with inventions that cure diseases, feed the world, and cope with climate change:

The move of the European Medicines Agency from London to Amsterdam should not get in the way of continuing to ensure that the EU updates and maintains a world-class approval system of medicines. Intensified collaboration with regulators such as the FDA and mutual recognition of approvals can further accelerate patients’ access to innovative medicine. National medicines agencies should also provide more transparency on which drugs are approved and which are currently being undergoing a review for market authorizations. Patients and third-party providers would benefit from this degree of transparency and open government.

European patients have the right to enjoy the fruits of medical breakthroughs in the future. Hence policy makers on national and EU level should stop advocating against innovation policies and start endorsing a policy framework in which innovation fosters. Attacks on intellectual property rights are to be seen as attacks on innovation and against patients that have diseases that can’t be cured or treated as of today.

The European Union’s trade policy should not just be extremely favorable towards innovative products and services originating from the United Kingdom, but also from the other side of the Atlantic. At the same time EU trade policy should be used to safeguard intellectual property rights globally. Strong intellectual property rights are necessary in order to foster innovation in Europe and allow the direly needed scientific breakthroughs in order to cure diseases we still struggle to cure. Attempts to undermine Intellectual Property in the European Union will make the EU’s global case for patents even weaker. Policy makers need to join those who already stood up for innovation and patients’ right to see new medicines being developed.

If the EU keeps pushing innovative technologies off the continent, it won’t be a surprise if innovations happen elsewhere in the world. But not only businesses will suffer from this but also consumers who would benefit from buying cheaper and more nutritious food. The EU should also open up more to green biotech and stop turning its back on breakthrough innovations in food and agricultural sciences. Genetically modified organisms can have a huge positive impact on the food supply in Europe and globally. Meatless burgers such as the Impossible Burger by Impossible Foods or the modified salmon by AquaBounty, which grows twice as fast as conventional salmon and can provide a position contribution towards fighting climate change, should be available to European consumers.77

New ways of analyzing data and simulating the biochemical interactions can increase the speed of research. The biotech sector is investing heavily in technologies such as Artificial Intelligence (AI) and Robotic Process Automation (RPA). It is yet hard to show the full potential of these technologies, but regulators need to enable them within a digital research framework. As part of the digital single market we need a digital health infrastructure that allows interoperability among eHealth systems and does not stifle the use of necessary data for medical research.

Science is progressing and can provide solutions to many problems the world faces. Innovations in environmental, medical, and agricultural technologies can elevate billions out of poverty, allow us to live longer and healthier, and have more choices in our daily lives. Europe needs to be at this scientific forefront and support policies that foster innovation and allow humanity to cope with the aforementioned challenges.

77 https://consumerchoicecenter.org/dont-ban-meat-grow-it-in-a-lab/