

European pharmaceutical industry response to coronavirus

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As the impact of the Coronavirus continues to be felt across the world, including recent deaths in Italy and France, the biopharmaceutical industry in Europe remains committed to global efforts to care for those affected, contain the outbreak and develop resources to tackle future outbreaks.

EFPIA members are heavily engaged in the Innovative Medicines Initiative (Call 21) to fast track collaborative research, identifying any suitable assets in their libraries that could be utilised to develop diagnostics, vaccines and treatments in the fight against coronavirus. In addition, the industry in Europe is providing financial support and in-kind donations to organisations on the ground as well as working closely with European, Chinese, and Global health authorities to combat this global public health emergency.

Many EFPIA members have R&D efforts under way or are providing donations of medicines and critical medical supplies as well as financial support to first responders in addressing this evolving crisis. Here are just a few ways Europe's research-based biopharmaceutical companies are working to combat the coronavirus:

R&D Efforts

EFPIA members are engaged in and supporting the development of collaborative research programmes in order to fast-track the development of therapeutics and diagnostics for the coronavirus to complement the ongoing global activities on CoV vaccines. Members have been donating investigational compounds that may have potential to treat coronavirus for emergency use and clinical trials, including compounds formerly tested on other viral pathogens such as Ebola and HIV. Other members are researching vaccine candidates for prevention and undertaking inventories of existing research portfolio libraries to identify additional potential treatments for research and development.

Partnerships

EFPIA member companies are collaborating with relevant European and global public health authorities including the Innovative Medicines Initiative, the European Medicines Agency, National Health Authorities across Europe as well as the World Health Organization (WHO), Centres for Disease Control and Prevention (CDC), Chinese public health authorities including the Chinese Centre for Disease Control and Prevention and many others to address this public health crisis. These collaborations are focused on all areas of research and development, including evaluating how pandemic preparedness platforms can potentially be tailored to address the coronavirus emergency, leveraging existing R&D partnerships to accelerate development of antiviral agents against COVID-19, and contribute both resources and expertise to various R&D consortia to address the outbreak.

Monetary and in-kind support

Millions of euros in direct monetary and in-kind contributions are being used to support organizations at the heart of the crisis who are able to have an immediate impact for infected

patients and communities in China. EFPIA member companies acted immediately on the ground in China to donate a variety of crucial supplies including advanced surgical equipment, antibiotics, disinfection equipment, batch virus testing devices (e.g., throat swabs), vitamins, protective clothing, goggles, masks, gloves and more.

Supply chain integrity

As the situation evolves, EFPIA member companies are continuing to prioritize the continuity of their supply chains and are working proactively to prevent and mitigate any potential shortages through close coordination with the EMA and other global stakeholders. At this stage, manufacturers have not reported any shortages or delays in production.

Below are just a few of many examples of how EFPIA member companies are supporting efforts in the detection, prevention and treatment of the coronavirus outbreak.

AbbVie: In late January, the Chinese health authorities identified Aluvia (lopinavir/ritonavir) as a potential treatment for the coronavirus and requested supply. AbbVie donated approximately \$2 million (USD) of Aluvia as an experimental option to help address the growing health crisis. AbbVie is also working with the WHO to ensure a coordinated global effort.

Bayer: Bayer has made substantial financial donations as well as donations of several medicines including an antibiotic to support those affected by the outbreak of COVID-19 in China. The donations have been made to the Chinese Red Cross, which is working with Chinese health authorities to coordinate the deployment of aid measures.

Boehringer Ingelheim: Boehringer Ingelheim (BI) is standing together with all parties to support the fight against the epidemic, making every effort to protect employees' health and safety. BI has made a number of donations totaling more than \$1 million (USD) to support the forefront fight against the epidemic in China including: A donation to the China Red Cross Foundation to purchase medical protective materials for hospitals in Wuhan and other cities in Hubei. This helps local frontline medical staff involved in their fight against the epidemic to treat patients more safely. The headquarters of BI also purchased 100,000 protective masks from Germany, which are donated to provide protection for medical staff in hospitals where the patients with the new pneumonia are treated. BI has also donated medicines to help treat patients with new pneumonia in Wuhan.

Roche and Genentech: Roche and Genentech, a member of the Roche Group, are providing scientific expertise and advice to the WHO and other relevant stakeholders given infectious disease is a key R&D focus area for them. The company is working with Chinese health authorities and the government to help provide screening and health care, including supporting local health officials and hospitals in the Hubei Province. They recently donated diagnostic tests, medical supplies and financial support for the affected region.

GlaxoSmithKline: GlaxoSmithKline (GSK) and the Coalition for Epidemic Preparedness Innovations, formed a new collaboration aimed at helping the global effort to develop a vaccine for the 2019-nCoV virus. In this new move, GSK will make its established pandemic vaccine adjuvant platform technology available to enhance the development of an effective vaccine against 2019-nCoV. GSK is a leader in the development of innovative vaccines using different adjuvant systems. An adjuvant is added to some vaccines to enhance the immune response, thereby potentially creating a stronger and longer lasting immunity against infections than the vaccine alone. The use of an adjuvant can be

of particular importance in a pandemic situation since it can reduce the amount of antigen required per dose, allowing more vaccine doses to be produced and made available to more people.

Johnson & Johnson: Johnson & Johnson (J&J) is seeking to further expedite its investigational coronavirus vaccine program through an expanded collaboration with the Biomedical Advanced Research and Development Authority (BARDA), part of the Office of the Assistant Secretary for Preparedness and Response (ASPR) at the U.S. Department of Health & Human Services. Additionally, J&J initiated a review of known pathways in coronavirus pathophysiology to determine whether previously tested medicines can be used to help patients survive a COVID-19 infection and reduce the severity of disease in non-lethal cases.

Sanofi: Sanofi Pasteur, the vaccines global business unit of Sanofi, will leverage previous development work for a SARS vaccine which may unlock a fast path forward for developing a COVID-19 vaccine. Sanofi is collaborating with BARDA, expanding the company's long-standing partnership with the Authority. Sanofi will use its recombinant DNA platform to produce a 2019 novel coronavirus vaccine candidate. The recombinant technology produces an exact genetic match to proteins found on the surface of the virus. The DNA sequence encoding this antigen will be combined into the DNA of the baculovirus expression platform, the basis of Sanofi's licensed recombinant influenza product, and used to rapidly produce large quantities of the coronavirus antigen which will be formulated to stimulate the immune system to protect against the virus.

The biopharmaceutical industry has the capacity and expertise to find and scale solutions to prevent and treat infection of the coronavirus and we will continue to provide updates on the response to the outbreak, and our member companies' contributions, as the situation evolves.

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