



Johnson & Johnson Innovation Champions Leading Edge Science with 15 New Collaborations with Potential to Impact Patients' Lives

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Collaborations advance novel solutions across pharmaceutical, medical device and consumer healthcare

NEW BRUNSWICK, N.J., Jan. 5, 2018 /PRNewswire/ -- [Johnson & Johnson Innovation LLC](#) today announced more than a dozen new collaborations to drive the development of novel solutions to impact healthcare. These collaborations bring the total number of strategic transactions executed by Johnson & Johnson Innovation to more than 350 since its establishment in 2012.

This latest series of deals focuses on leveraging advances in science and technology to address areas of high unmet medical need, including the use of artificial intelligence to detect signs of Alzheimer's disease years before it becomes apparent; the identification of throat cancers with a simple saliva test; and harnessing the microbiome to treat sleep disorders.

"Our highest priority is to improve the health of people around the globe, and each collaboration announced today represents a unique opportunity to explore novel therapeutics, medical devices and consumer health solutions," said Paul Stoffels, M.D., Executive Vice President and Chief Scientific Officer, Johnson & Johnson. "By advancing transformative healthcare innovations together with entrepreneurs, academic centers and institutions, we are one step closer to addressing many pressing global healthcare challenges."

The collaborations announced today include:

Neuroscience

- **Fighting Alzheimer's Disease with Gene Therapy** – Johnson & Johnson Innovation LLC and Janssen Pharmaceuticals, Inc. (JPI) have established an exclusive research collaboration with the University of Pennsylvania's Gene Therapy Program that will utilize Adeno-associated virus (AAV)-vectors developed by the University of Pennsylvania and antibodies targeting Alzheimer's disease developed by JPI. The collaboration aims to use AAV viral delivery to express therapeutic antibodies that target the main pathological hallmarks of Alzheimer's disease. The use of AAV as a gene delivery method has the potential to transform the way biologic therapies are administered for Alzheimer's and other brain conditions, opening up novel approaches to treating many devastating neurological diseases. JPI will have exclusive global rights to commercialize products developed under this agreement.
- **Measuring Neuropsychological Health** – Johnson & Johnson Innovation LLC and Janssen Pharmaceuticals, Inc. (JPI) announced a collaboration with the Northern California Institute for Research and Education and the San Francisco Veterans Affairs Medical Center to investigate the utility of online neuropsychological assessments to monitor brain health in elderly people. This collaborative effort is an extension of JPI's work with the Brain Health Registry on the use of JPI's ReVeRe® platform that measures cognitive performance, including verbal episodic memory, using speech recognition technology.
- **Exploring the Role of the Microbiome in Sleep** – Johnson & Johnson Innovation LLC, Johnson & Johnson Consumer Inc. and Janssen Research & Development, LLC have established an exclusive research collaboration with Holobiome Corporation, a developer of microbiome therapeutics, to treat diseases of the central and enteric nervous systems. The collaboration will examine a consortium of bacteria that could be used to create a differentiated probiotic or over-the-counter offering that addresses sleeplessness. In addition to sleep disorders, these bacteria may also be used in the treatment of other potential conditions.
- **Leveraging AI to Predict Neurodegenerative Diseases** – Johnson & Johnson Innovation facilitated an exclusive feasibility study between Janssen Research & Development, LLC and WinterLight Labs, Inc., a JLABS @ Toronto-based company. The research will evaluate WinterLight's proprietary technology for analyzing voice samples obtained from Janssen Research & Development's ongoing clinical trials in Alzheimer's and neurodegenerative diseases. The goal is to non-invasively predict dementia and neurodegenerative diseases long before clinical symptoms become apparent.

Oncology

- **Preventing, Intercepting and Curing Lung Cancer** – The Johnson & Johnson Lung Cancer Initiative (LCI) announced a collaboration with the Koch Institute for Integrative Cancer Research at MIT to conduct research aimed at eradicating lung cancer. Under this agreement, an LCI team will leverage cross-sector pharmaceutical, medical device and consumer product R&D efforts with teams from the labs of Drs. Tyler Jacks, Sangeeta Bhatia and Darrell Irvine, to create multidisciplinary approaches to prevent, intercept and cure lung cancer. The research agreement was executed by Janssen

Biotech Inc.

- **Developing a Saliva Test for Cancer** – Johnson & Johnson Innovation LLC and Janssen Cilag Pty Ltd. have extended a collaboration with Queensland University of Technology (QUT) to develop a saliva-based diagnostic for early detection of throat cancers. The new technology aims to identify people who are at risk for throat cancers and intercept asymptomatic disease before invasive treatments are needed.
- **Advancing Biomarker Diagnostics for Lung Cancer** – To advance ground-breaking science and health solutions for lung cancer, Johnson & Johnson Innovation LLC and Janssen Pharmaceutica NV have formed a collaboration with MiRXES Pte Ltd, a Singapore A*STAR spin-off, to develop a novel lung cancer diagnostic test with the aim to improve the detection of early-stage disease.

Other Areas

- **Harnessing Bacteria to Fight Skin Disease** – Johnson & Johnson Innovation LLC and Johnson & Johnson Consumer Inc. have formed a collaboration with JLABS @ San Diego resident Dermal Inc. to develop microbiome-derived treatments for skin conditions. Dermal's technology harnesses the beneficial function of good skin bacteria to eliminate the bad bacteria and balance the microbiome.
- **Preventing Psoriasis** – Psoriasis is a chronic immune-mediated disease that affects millions of people around the world. Johnson & Johnson Innovation LLC and Janssen Biotech Inc. have extended a research collaboration with Monash University aimed at further exploring the underlying triggers of psoriasis to discover and develop potential new treatments that prevent future occurrences of the disease.
- **Improving Skin Biopsies** – Johnson & Johnson Innovation LLC and Janssen Biotech Inc. have formed a collaboration with MiNDERA, a JLABS @ South San Francisco resident company. MiNDERA is advancing a minimally invasive microneedle device to better enable the research, diagnosis and treatment of inflammatory skin diseases at the molecular level.
- **Discovering Novel Therapeutics for Obesity** – Obesity is a growing epidemic that affects more than one in three adults in the United States and often leads to diabetes, heart disease, stroke and some types of cancer. Janssen Pharmaceuticals, Inc. has formed a multi-year research collaboration with Beacon Discovery Inc., a G-Protein Coupled Receptor (GPCR) drug discovery incubator, to discover and develop next-generation therapeutics to treat obesity and other metabolic diseases.
- **Driving Innovation Through Partnering** – Johnson & Johnson Innovation LLC is collaborating with Monash University, supported by the State Government of Victoria, to establish the Johnson & Johnson Innovation Partnering Office @ Monash (JJIPO @ Monash). The partnering office will work with Victoria's medtech and pharma ecosystem to source Victorian technologies and deliver training, mentoring and networking programs to the next generation of entrepreneurs for the benefit of patients globally.
- **Seeing the Future of Vision Care Up Close** – Myopia (near-sightedness) affects 30 percent of the world's population. Prevalence has more than doubled over the last 40 years and is projected to reach 50 percent by 2050. Johnson & Johnson Innovation LLC and Johnson & Johnson Vision, through its operating company Johnson & Johnson Vision Care, Inc., have extended their long-standing collaboration with Queensland University of Technology to research and develop novel contact lenses to slow the progression of myopia and bring breakthrough eye health solutions to people around the world.
- **Discovering Objective Biomarkers for Ocular Response to Contact Lens Wear** – Johnson & Johnson Vision, through its operating company Johnson & Johnson Vision Care Inc., has formed a collaboration with Narayana Nethralaya Foundation and Medical Research Foundation for the discovery and validation phases of developing diagnostic tools that can be used to identify a person's unique vision-care needs to help facilitate the matching of vision correction options.
- **Advancing Life Science Research and Development Activities in Taiwan** – Johnson & Johnson Innovation LLC, Asia Pacific and Janssen Research & Development, LLC, have formed a collaboration with the Taiwan Industrial Technology Research Institute to set up co-funding agreements for projects in lung cancer, chronic obstructive pulmonary disease, diabetes, eye health and digital health initiatives. This program will provide co-funding and mentoring to one or more research programs undertaken by public sector participants and start-up companies that meet the requisite factors and are jointly selected by the program founders.

"At Johnson & Johnson Innovation, we have a collaborative approach to partnering and tailor each deal to the needs of the company and its technology so we can accelerate the best science to solve today's healthcare challenges," said Robert G. Urban, Ph.D., Global Head, Johnson & Johnson Innovation LLC. "Our approach to external innovation has been incredibly fruitful, as we established more than 60 significant new strategic relationships in 2017."

In addition to these new strategic collaborations, Johnson & Johnson Innovation has expanded its search for innovative healthcare solutions through 22 QuickFire Challenges launched since 2014. More than 1,500 entrepreneurial applicants from around the world have made submissions for the 19 contests that have been completed, representing more than \$4 million in awards. These challenges, which have focused on a wide range of topics from artificial intelligence and baby care to drug safety, will continue to expand, with three current QuickFire Challenges in areas such as digital beauty, creating the lab coat of the future and others to launch later in 2018.

In addition to the deals announced today, several further strategic transactions occurred in the second half of 2017 that have the potential to enrich the

life science ecosystem on a global scale.

- Johnson & Johnson Innovation – JJDC, Inc. participated in a \$5.9 million Series A financing round in Rodeo Therapeutics Corporation, an Accelerator Life Science Partners startup. The company is focusing on creating agents to treat inflammatory bowel disease and enable faster cell growth for patients who have undergone bone marrow transplantation.
- Provention Bio, Inc. announced in September agreements with Janssen Pharmaceutica NV and Janssen Sciences Ireland UC to license two Janssen clinical-stage assets aimed at intercepting and preventing immune-mediated diseases.
- Johnson & Johnson Innovation – JJDC Inc. participated in a Series B financing of XW Laboratories Inc. (XW Labs), a biopharmaceutical Research and Development company focused on neurological disorders. XW Labs raised \$23 million from its Series A and B rounds, and will utilize funds to continue the development of its multiple programs that are entering clinical and investigational new drug-enabling studies.
- Johnson & Johnson Innovation – JJDC Inc. led a \$46 million Series A financing for Fusion Pharmaceuticals Inc., a biopharmaceutical company developing targeted alpha-particle radiotherapeutics for treating cancer. Targeted alpha-particle emitting radiotherapeutics combine the precision of molecular targeting agents, such as antibodies, with the potency of alpha-particle emitting radioisotopes to specifically attack and eradicate cancer cells.
- In October, Janssen Pharmaceuticals, Inc. expanded its collaboration with former JLABS @ San Diego resident, Arcturus Therapeutics, Inc., to bring new treatments to patients with Hepatitis B. Under the collaboration, facilitated by Johnson & Johnson Innovation, the companies have the ability to expand to additional disease areas together, including HIV and respiratory viral infections.
- In October, The Milner Therapeutics Institute at the University of Cambridge announced that Janssen Biotech, Inc. is now part of its global therapeutic alliance. The alliance now includes seven pharmaceutical companies and three Cambridge academic institutions who have signed a consortium agreement, with associated funding, to engage in collaborative research in Cambridge. The arrangement was facilitated by Johnson & Johnson Innovation.
- The Center for Device Innovation at the Texas Medical Center (CDI @ TMC) in Houston, Texas opened in November as a collaboration among the Johnson & Johnson Medical Device Companies, Johnson & Johnson Innovation and the Texas Medical Center to accelerate the development of breakthrough medical devices.
- Johnson & Johnson Innovation – JJDC Inc. led a \$40 million investment in On Target Laboratories, Inc., a privately-held biotechnology company that is developing tumor-targeted fluorescent dyes to improve cancer surgery. On Target announced plans to use the funding to further advance the development of its lead imaging compound, OTL38, for use in detecting multiple cancers, including ovarian and lung, and also to develop a second imaging compound for additional cancers.
- Johnson & Johnson Innovation launched JLABS @ Shanghai in December in collaboration with Shanghai Municipal Government, Pudong New Area Government and Shanghai Pharma Engine Company Ltd. Located in Shanghai's Zhangjiang Hi-Tech Park, JLABS @ Shanghai will provide startups with many of the advantages of being part of an established innovation hub, such as access to talent and mentors, large existing firms and research universities, capital and convergence opportunities with other sectors.
- Johnson & Johnson Innovation, Division of Johnson & Johnson (China) Investment Ltd., in collaboration with Seoul Metropolitan Government, Korea Health Industry Development Institute (KHIDI), Janssen Korea Limited and Johnson & Johnson Medical Korea Limited, opened the Johnson & Johnson Innovation Partnering Office at Seoul Bio Hub in Seoul, Korea in December.

About Johnson & Johnson Innovation

Johnson & Johnson Innovation LLC focuses on accelerating all stages of innovation worldwide and forming collaborations between entrepreneurs and Johnson & Johnson's global healthcare businesses. Johnson & Johnson Innovation provides scientists, entrepreneurs and emerging companies with one-stop access to science and technology experts who can facilitate collaborations across the pharmaceutical, medical device and consumer companies of Johnson & Johnson. Under the Johnson & Johnson Innovation umbrella of businesses, we connect with innovators through our regional Innovation Centers, Johnson & Johnson Innovation / JLABS, Johnson & Johnson Innovation – JLINX, Johnson & Johnson Innovation – JJDC, Inc. and our Business Development teams to create customized deals and novel collaborations that speed development of innovations to solve unmet needs in patients. For more information, visit www.jnjinnovation.com or follow @JNJInnovation.

Cautions Concerning Forward-Looking Statements

This press release contains "forward-looking statements" as defined in the Private Securities Litigation Reform Act of 1995 regarding investments and collaborations seeking to advance research and development of healthcare solutions and technologies. These forward-looking statements are based on current expectations and beliefs. However, there are substantial risks and uncertainties that could cause actual outcomes to vary materially from the expectations or projections expressed or implied by Johnson & Johnson Innovation LLC, Johnson & Johnson and their affiliated companies. Risks and uncertainties include, but are not limited to: the potential that the expected benefits and opportunities related to the collaborations may not be realized or may take longer to realize than expected; challenges and uncertainties inherent in research and development of new products, including the possibility that research might not yield beneficial results and the uncertainty of clinical success and obtaining regulatory approvals; competition, including technological advances, new products and patents attained by competitors; changes in behavior and spending patterns of purchasers of health care products and services; and global health care reforms and trends toward health care cost containment. Further discussion of the risks, uncertainties and other factors that could cause actual results to differ from the expectations expressed in this release can be found in Johnson & Johnson's Annual Report on Form 10-K for the fiscal year ended January 1, 2017, including under "Item 1A. Risk Factors," in its most recently filed Quarterly Report on Form 10-Q, including in the section captioned "Cautionary Note Regarding Forward-Looking Statements," and the company's subsequent filings with the Securities and Exchange Commission. Copies of these filings are available online at www.sec.gov, www.jnj.com or on

request from Johnson & Johnson. Johnson & Johnson Innovation LLC, Johnson & Johnson and their affiliated companies do not undertake to update any forward-looking statement as a result of new information or future events or developments.

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