



DR. JOHN W. GILLARD

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PRESENTATION TITLE: Design and Development of High-Affinity ACE2 Surrogates as Potent Covid19 Therapeutic Agents

ABSTRACT: Dr. John Gillard is founder of JN Nova Pharma, a private Canadian biotech company, founded in early 2020 to develop promising biological therapeutic molecules with corona-viral neutralizing and simultaneous organ-protective properties, due to the replacement of lost ACE2 enzyme. This proprietary drug class was discovered and is being developed in close collaboration with Canada's National Research Council's (NRC) - Human Health Groups in Montreal and Ottawa, Canada.

JN2019 Class is Designed to Trap the Corona-virus and ReplACE lost ACE2. The extra-cellular domain of ACE2 is the actual human coronavirus target of the S1 spike protein, this interaction is essential and occurs for all viral S1 variations that have emerged. Proprietary leads were selected that incorporate binding-domain peptide modifications to very potently bind, trap and inhibit viral entry into the lungs, trapping is independent of S1 changes, that render antibodies and vaccines inefficacious. In addition to trapping and causing viral clearance, these agents provide long-lasting ACE2 enzyme replacement, achieved by the delivery of the viral-trapping ACE2 analogue as an Fc fusion protein, with a selective FcRn receptor binding domain and reduced FcγRI and RII binding. This design permits longer systemic half-life and provides for pulmonary epithelial transport to facilitate inhalation as a convenient, effective route of administration.

The Severity Problem: ACE2 Loss in the lungs and kidneys

A primary cause COVID-19 related severe side-effects is the loss of ACE2, the key protective arm of the renin-angiotensin system (RAS). ACE2 is proteolytically cleaved from the extracellular surface by an inflammation-related enzyme, ADAM-17. This results from the activation of receptor-stimulated p38 mitogen-activated-protein-kinases (p38 MAPKs) and extracellular signal-regulated kinases (ERKs) which are induced by the viral S1 spike protein.

Patients with high vulnerability to severe disease have cardio-vascular, renal, diabetic, and obese conditions, and are particularly susceptible to ACE2 loss, induced by viral infection. More than 80% of hospitalized patients are such vulnerable patients, death rates are 3-6 times higher and chronic long-term effects are also likely to be induced by continued ACE2 loss. Therefore, developing a therapeutic approach that replaces lost ACE2 in the lungs and the kidney is critical in mitigating one of the more devastating side effects of the COVID virus and all its emerging variants. JN2019M5.2 is in GMP production for a clinical trial proposed in early 2023.

BIOGRAPHY: Dr. John Gillard is one of Canada's precision medicine biotech pioneers with major discovery and development experience and participation in Biotech and Investor Advisory Boards.

- PhD University of Tasmania: Structure and Synthesis of Proteaceous Alkaloids
- Post Doctoral Fellowships at Boston College, Harvard Medical School, Boston MA., Institut de Recherche des Substances Naturelle, CNRS, Paris

- Director of Medicinal Chemistry at Merck Laboratories, Montreal: Discovery of FLAP and 5LO & Inhibitors as Asthma Targets and Drugs leading to Singulair®
- VP Research BioChem Pharma, led discovery and developed landmark anti-viral drugs 3TC® for HIV and Efavir® for HBV
- Founder and CSO of Aegera Therapeutics, led five NCE clinical developments in IAP inhibition for cancer treatments & large-pharma licensing deal and sale to HGS
- Kalgene, Founder and SVP, Head of Product Development for a BBB penetrating amyloid blocking biological agent for Alzheimer's Disease
- Advisory Board Lumira Ventures
- Founder CEO of JN Nova Pharma dedicated to ACE2 Enzyme replacement therapeutics
- Adj. Professor Dept Pharmacology McGill University

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