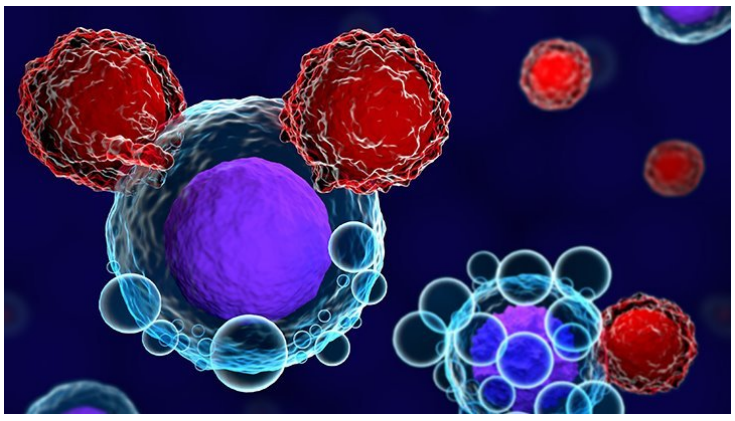
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GSK and Lyell Immunopharma to develop new cancer cell therapies

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Collaboration will combine Lyellâ??s technologies with GSKâ??s pipeline of cell therapies and manufacturing capability



GlaxoSmithKline plc has announced a five-year collaboration with Lyell Immunopharma, a San Francisco biotechnology company, to develop new technologies to improve cell therapies for cancer patients. The collaboration will apply Lyell's technologies to further strengthen GSK's cell therapy pipeline, including GSK3377794, which targets the NY-ESO-1 antigen that is expressed across multiple cancer types.

To date, two cell therapies have been approved for blood-borne cancers, but engineered T cells have not yet delivered strong clinical activity in common solid tumours. Improving the "fitness" of T cells and delaying the onset of T cell exhaustion could help engineered T cell therapies become more effective. Combining GSK's strong cell and gene therapy programmes with Lyell's technologies may allow the joint research team to maximise the activity and specificity of cell therapies in solid tumour cancers, where there is a high unmet medical need.

Dr. Hal Barron, Chief Scientific Officer and President, R&D, GSK said: "We are witnessing significant scientific innovation in cell and gene therapies, transforming the treatment of some blood-borne cancers, but patients with solid tumours are in need of equally effective treatments. Applying Lyell's novel approach to counter T cell exhaustion and working with world class scientists, such as Rick Klausner and his impressive team, increases our probability of delivering the next generation of cancer cell therapies for patients with solid tumours."

Lyell is exploring several approaches to improving T cell function and increasing T cell "fitness" to enhance initial response rates in solid tumour cancers and to prevent relapses due to loss of T cell functionality. As Lyell addresses inhibition of T cells by the tumour in a fundamental way, there is an opportunity that these technologies can be used as a platform for multiple new cell and gene therapies that can be applied across a broad range of rare and prevalent solid cancers.

Dr. Rick Klausner, founder and CEO, Lyell Immunopharma said: "Our approach is to tackle three of the most significant barriers to T cell efficacy in solid tumours. We are redefining the ways we prepare patient cells to be made into therapies, modulating cells' functionality so that they maintain activity in the tumour microenvironment, and establishing methods of control to achieve specificity and safety for solid tumour-directed cell therapies."

Lyell has a scientific management team with a long history in the field of immune cell therapy. Rick Klausner is the former head of the National Cancer Institute (NCI) and co-founder of Juno Therapeutics, and whose lab discovered the molecular engine behind T cell receptor and CAR signalling; Stan Riddell, co-founder and the Head of R&D, co-founder of Juno whose pioneering work over three decades at Fred Hutchinson Cancer Research Center has helped to define the parameters of successful adoptive cell therapy; Nick Restifo, EVP of Science, whose research over 25 years at the NCI defined the properties of the T cells capable of therapeutic efficacy in cancer; and Margo Roberts, CSO, whose work in adoptive T cell therapy includes serving as CSO of Yescarta® maker *Kite* Pharma, administering the first CAR T cell into patients in 1993, and demonstrating the role of co-stimulation in T cells for effective CARs.

Next generation engineering that leverages Lyell technologies could further enhance the benefit/risk profile of GSK's lead programme and other cell therapies in GSK's pipeline. GSK3377794 uses genetically engineered autologous T cells and is currently in Phase 2, on an accelerated development path.

The collaboration will also build on GSK's world-leading manufacturing platform and expertise for cell and gene therapy that delivered the world's first approved *ex vivo* gene therapy (Strimvelis) for ADA-SCID in 2016. GSK has granted patents and pending patent applications related to its stable cell line technology (SCLT) and has a long-standing collaboration with Miltenyi Biotec to improve quality and scale of output to meet the needs of larger patient populations.

Lyell co-founders also include Crystal Mackall, M.D., who has pioneered work on T cell exhaustion, and David Baker, Ph.D., Director of the University of Washington Institute for Protein Design, whose novel approaches to protein engineering provide technologies to enable enhanced precision, control and safety in cell-based therapies.