**PRESS RELEASE**

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# Ziccum reports significant progress in 3D-modelling project with model completion

**Ziccum AB and project partner Zurich institute of Applied Sciences (ZHAW) have made a milestone review of the LaminarPace simulation (LaPaSim) project progress and findings. The complex, dynamic model digitally replicating the LaminarPace operation has been created and validated against comprehensive data sets created in physical trial runs and is now reaching a stage close to full completion. Ziccum can now perform trial runs in the 3D simulation environment, enabling the generation of vast amounts of data and in-depth understanding of optimal parameters and scale-out.**

The LaPaSim project is developing a 3D multi-physical model of Ziccum's unique drying technology LaminarPace to evaluate and predict key-performance-attributes, such as flow rates, temperatures, pressures and substance output, for a full range of LaminarPace applications.

The project is a collaboration between Ziccum and the Institute of Computational Physics (ICP) at the School of Engineering at Zurich's ZHAW University of applied sciences. The ICP Multiphysics Modeling and Imaging team, led by Professor Gernot Kurt Boiger, specialize in developing multi-physical models of complex industrial processes using mathematical models.

A 2-day workshop on 22 – 23 February with Ziccum and the ICP team marked the completion of the latest stage of the project. Several milestones have been achieved: a 3D numerical simulation OpenFOAM model which accurately reflects LaminarPace's geometry and multi-dimensional parameter space is now close to completion. The model can be adapted to a range of process-design-concepts and has cloud-computing compatibility for all scripts and software, meaning that it can be seamlessly integrated into chosen cloud platforms capable of Massive Simultaneous Cloud Computing.

With the 3D model now set up, the LaminarPace development can proceed with trial runs in the 3D simulation environment, enabling the generation of vast amounts of data to gain in-depth understanding of optimal process parameters and how to best scale-out the technology to commercial scale.

Ann Gidner CEO: "I am extremely pleased we went for this cutting-edge digital solution to enable technology development in a very short time frame, compared to having to do physical trial experiments only. As we are developing a unique, novel technology, everything is basically unknown, and it would have been very time consuming to use only traditional methods. Now that

we can start digital data generation, we open up to massive, new learnings to take LaminarPace efficiently forward. Please let me extend my sincere gratitude to the ZHAW team for their solid contributions here. It is a delight to put our two dedicated teams together and see the creativity and progress."

**About Multiphysics Models**
Developing Multiphysics Models is a complex, multi-stage process that involves detailed modelling and interrelations between chemical engineering and key physics parameters, from diffusion and diffusivity to thermal conduction and steady state temperature. However, the range and accuracy of such models is far greater than models calculated from physical processes alone. The model is built from the bottom up, using mathematical models (in this case an axisymmetric OPENFoam model) developed from voluminous digital datasets gathered form physical tests. This model is then validated, as this LaminarPace model has been, in a further round of physical tests.

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**About Ziccum**

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Ziccum is developing LaminarPaceTM, a unique drying method for biopharmaceuticals and vaccines based on mass transfer, not heat transfer. The technology is offered by licensing to vaccine and biologics developers and manufacturers in the global pharmaceutical industry. By reducing drying stress to the active ingredient, LaminarPaceTM uniquely enables particle-engineered, thermostable dry powder biopharmaceuticals which can be easily handled and transported and are highly suitable for novel administration routes. The technology has been successfully applied to mRNA, peptides, proteins, antibodies, lipids and enzymes as well as excipients and adjuvants, and is well suited for industrial application. Ziccum is listed on the Nasdaq First North Growth Market.

**Attachments**

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