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The GeSiM BioScaffolder 3.1 – A 3D bioprinter not only for bioprinting

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Manufacturing three-dimensional bioscaffolds is revolutionizing cell biology, as only 3D cell cultures are physiological and eventually lead to printed organs for transplantation. GeSiM has therefore developed a 3D biomaterial printer, which is not just another “me-too” instrument, as revealed by its unprecedented flexibility. The BioScaffolder is based on a proven belt-driven robotic platform with up to seven Z-drives, controlled by a programmable logic controller box also providing pressure regulation and liquid handling, and one software for all configurations. Mounting other tools converts the BioScaffolder to numerous other lab robots, i.e. for micro arraying, standard liquid handling, parallel chemical micro-synthesis, bioscaffold printing, micro contact printing (μ CP), nanoimprint lithography (NIL), and more. The standard BioScaffolder combines gas-pressure-controlled extrusion of three pastes (cooled or heated) with non-contact spotting of small drops of signal proteins, cell suspensions etc. Fine adjustment works by measuring tip positions and substrate heights. Further head functionalities are camera for target finding and quality control, UV cross-linking, printing of vascular (core/shell) structures, high-temperature filament extrusion, displacement liquid dispensing with disposable tips, dual piezo pipetting with in-flight droplet mixing, glue and powder micro dispensing, solvent dispensing and evaporation, cap opening, vacuum gripping, μ CP/NIL stamping, spin coating, and pH titration. Tools on the base plate can be high-temperature reactors and holders for tips/needles, microliter plates (cooled/heated), slides, Eppendorf Tubes or reaction vessels; completed by ancillary tools like tip cleaning and measuring station, washing/drying stations and stroboscope for piezo pipettes. Tools can be mixed and matched. We will present the numerous options and practical examples.

Biography

Frank-Ulrich Gast completed his PhD in Biochemistry at University of Hannover, Germany and Post-doctoral studies at University of Colorado Health Sciences Center, Denver, at Max-Planck Institute for Biochemistry, Martinsried, and at Justus Liebig University, Gießen. Since 2002, he is in the marketing & sales team of GeSiM, a major provider of microfluidic instrumentation and lab automation. He has more than 20 entries in PubMed, mainly on protein-nucleic acid interactions, and published more papers in other journals.

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