Title: A complete microfuidic based lab-on-a-chip system for AT-home in field on-site real-time purification of total DNA/RNA and direct isothermal multiplex amplification and detection

Name: Frank Karlsen
University of South-Eastern Norway (USN), Raveien 215, 3184 Borre, Norway

Within the last 20 years, institutes, companies and universities around the whole Europe have developed a complete microfluidic based platform for automatic sample preparation, purification of total DNA/RNA and isothermal amplification and detection of more than 16 genes or transcripts at the same time. The platform has the name SALICO when used in health applications or FORDETECT when used on environmental applications. The unique patented platform and technology owned by the USN combine a network of valves, microfluidic channels, reaction chambers and microfluidic valves, with supporting cover of liquid storage chambers, waste chamber and extractions chambers with external pumps systems, step engines, linear optical systems, actuators, magnetic probe and heating elements. The system on board allow handling up to one ml sample, wash buffers and chemical with the ability to transport back and forth within the whole platform secure optimal sample preparation and total DNA/RNA purification. Microfluidic valves in the 40 micrometer range are combined with a supply channel that secure separate use of up to 32 different two-primer one molecular beacon probe. The platform is ideal for the direct connection with microfluidic devices that needs supply of purified DNA or RNA or real-time platforms able to sequence RNA directly. Results from different studied done on the SALICO cassette and instrument are included. The SALICO technology is today at the TRL level 5 with a complete plan for test production and TRL level 7.

Biography

Frank Karlsen took his PhD on molecular pathology and virology in 1997 and his Post-Doc in environmental microbiology in 1999 at the Oslo University. He has studied lab-on-a-chip technology since 1994 and have developed microTAS solutions since 1999. He became a professor in micro- and nanosystem technology in 2010 and is today educating bachelor, master and PhD students in BioMEMS related subjects. He has been head of the R&D company NorChip for 10 years from 2000 to 2010. He has more than 120 per-review and posters papers. He has 27 patents in different fields.

Full name: Frank Karlsen
Contact number: +4740403480