Short Communication

Stereolithographic Additive Manufacturing of Ceramic Components Using Nanoparticles Paste

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ABSTRACT: Our aim was to develop two DNA sensors to detect Alzheimer's or Diabetes disease using photonicity. The DNA sensors were based on constructed E. Coli or Saccharomyces cerviceae using synthetic biology by assembling genetic sequences and they were tested in terms of fluorescence expression units (FSU) when mixed with human blood plasma or saliva using a fluorescence detector. The intensity of the detection was enhanced by labeling the fluorescence targeted molecules in samples, and it was carried out through conjugation method using fluorescent dyes. The Raman intensity and shift of the scattered photon (at 785nm) energy of the Raman confirm the expression of the amyloid protein or glucose related protein for detection of Alzheimer's or diabetes respectively. Also, the photon (at 633nm) scattered energy from the Zeta-Sizer determined the particle size of the denoted proteins in the sensor and in the fluids. Fluorescence results were comparable to clinical and MRI results. The DNA sensors were able to detect β-amyloid protein or protein related to glucose in different type of patients. Results were also correlated with the glycemic levels of the patients. Proteins were corroborated using ELISA and Western Blot assays. Due to the highly correlation between fluorescence intensity and levels of β-amyloid or glucose-protein, these results were used to classify patients according to the severity of disease (i.e. Group1: Alzheimer's Diagnosed (158100) or Diabetes (6957); Group2: Pre-Alzheimer's (127700) or Pre-Diabetes (5500); and Group3: Normal) (23970/3600). Statistical analysis showed that the groups were well categorized according the selected parameters. Gender seemed to be an associate factor at time of the Alzheimer's onset.

Biography

Soshu Kirihara is a doctor of engineering and a professor of Joining and Welding Research Institute (JWRI), Osaka University, Japan. In his main investigation "Materials Tectonics" for environmental improvements of "Geotechnology", multi-dimensional structures were successfully fabricated to modulate energy and materials flows effectively. Ceramic and metal components were fabricated directly by smart additive manufacturing, design and evaluation (Smart MADE) using high power ultraviolet laser lithography. Original stereolithography systems were developed, and new start-up company "SK-Fine" was established through academic-industrial collaboration.

Recent Publications

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Citation: Soshu Kirihara, Stereolithographic Additive Manufacturing of Ceramic Components Using Nanoparticles Paste

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