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Title: Tamed Cancer: Personalized Healthcare Approach by Control Engineering Methods

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Abstract

The key of scientific success in every field nowadays depends on interdisciplinary design. Medical treatment is not an exception either, engineers and doctors have to work together to find more effective solutions in healing. Imagine if the optimal administration (dosage, delivery method and frequency) of anticancer drugs can be calculated, it would improve efficiency, decrease treatment cost and minimize side effects of cancer therapy. This optimal administration can be solved by using a controller in a closed-loop. In other medical fields, such as treatment of diabetes mellitus, this closed-loop control is already researched e.g. the artificial pancreas problem. Similarly, we may have the possibility to measure the tumor volume, create a pump for drug administration, and design control algorithms for specific tumor types. Hence, a personalized approach would be possible, allowing to increase the quality of life, but by optimized drug delivery the treatment cost as well. This novel approach may lead to a breakthrough in cancer therapies.

Short bio



Levente Kovács received his MSc degrees in electrical engineering (2000) from "Politehnica" University of Timisoara, Romania and biomedical engineering (2011) from Budapest University of Technology and Economics (BME), Hungary. He received his PhD from BME in 2008. His fields of interest are modern control theory and physiological controls – within these subjects, he has published more than 300 articles in international journals and refereed international conference papers, accumulating an impact factor over 20 and h-index is 14. Currently, he is a professor at Óbuda University, Hungary, where he defended his habilitation with merit in 2013. He is the vice dean for education of John

von Neumann Faculty of Informatics and head of the Physiological Controls Research Center. He was János Bolyai Research Fellow of the Hungarian Academy of Sciences between 2012-2015. He is IEEE member and IEEE EMBS, IEEE SMC and IEEE CSS Society member. At IEEE Hungary Section level Dr. Kovács is chair of the section from 2017, and chair of the IEEE SMC Hungary Chapter from 2015. In 2015 he is a recipient of the highly prestigious ERC StG Grant of the European Union (Grant No 679681 – Tamed Cancer).

