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## Mass spectrometry: Clinical artificial intelligence application

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**Background:** Erythrocytes Dynamic Antigens Store (EDAS) is a new discovery. EDAS consists of self-antigens and foreign (non-self) antigens. In patients with infectious diseases or malignancies, antigens of infection microorganism or malignant tumor exist in EDAS.

**Objective:** Storing EDAS of normal individuals and patients in a database has, at least, two benefits. First, EDAS can be mined to determine biomarkers representing diseases which can enable researchers to develop a new line of laboratory diagnostic tests and vaccines. Second, EDAS can be queried directly, to reach a precise diagnosis without need to do many laboratory tests. The target is to find the minimum set of proteins that can be used as biomarkers for a particular disease.

**Methods:** A hypothetical EDAS is created. Hundred-thousand records are randomly generated. The mathematical model of hypothetical EDAS together with the proposed techniques for biomarker discovery and direct diagnosis are described. Experiments by generating case possibilities are conducted.

**Results:** Biomarkers proteins are identified for pathogens and malignancies, which can be used to diagnose conditions that are difficult to diagnose.

**Conclusions:** The presented tool can be used in clinical laboratories to diagnose disease disorders.

### Biography

Mahmoud Abdel Wahed Rafea completed his Graduation from the Faculty of Medicine at Cairo University in 1975. He completed his MSc in Clinical Pathology and Chemistry in 1980. He started studying computer science while working as a clinical pathologist in 1984. He joined ARC (Agriculture Research Center) in 1992. He got his PhD in Artificial Intelligence from Cairo University. He worked as a Senior Researcher in SICS (Swedish Institute of Computer Science) from 2000-2002. He was promoted by ARC as a Full Professor in Computer Science, 2006. In 2009 and 2010 he worked as a visiting Professor in Karolinska, Sweden. He discovered that erythrocytes have a dynamic antigens store. In 2015, he established the Erythrocytes Research Unit (ERU) under ARC. He incorporated Erythra Corporation in 2018.

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