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A Blockchain-Based Notarization Service for Biomedical Knowledge Retrieval

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Abstract:	Biomedical research and clinical decision depend increasingly on scientific evidence realized by a number of authoritative databases, mostly public and continually enriched via peer scientific contributions. Given the dynamic nature of biomedical evidence data and their usage in the sensitive domain of biomedical science, it is important to ensure retrieved data integrity and non-repudiation. In this work, we present a blockchain-based notarization service that uses smart digital contracts to seal a biomedical database query and the respective results. The goal is to ensure that retrieved data cannot be modified after retrieval and that the database cannot validly deny that the particular data has been provided as a result of a specific query. Biomedical evidence data versioning is also supported. The feasibility of the proposed notarization approach is demonstrated using a real blockchain infrastructure and is tested on two different biomedical evidence databases: a publicly available medical risk factor reference repository and on the PubMed database of biomedical literature references and abstracts.