

Use of Stable and Standardized Human Plasma as a Reference for Medical Analysis

Geneva Health Forum 2026 · 10–12 November 2026 · Campus Biotech, Geneva



DERNI Rezki | PhD Student

Supervisor: Prof. Veronika Kralj-Iglič

University of Ljubljana · Faculty of Health Sciences · Slovenia

ABSTRACT

Pre-analytical variability and sample degradation compromise measurement reproducibility and quality control in laboratory medicine. This study investigates a human plasma stabilization platform combining nanostructure engineering and electromagnetic control to preserve biochemical markers. The platform is intended to complement routine workflows by providing standardized reference material for quality control and analytical comparability.

INTRODUCTION

Human plasma is diagnostically informative but vulnerable to temperature fluctuations, oxidation, and processing delays. We investigate whether plasma can be stabilized as a reference material without losing key biomolecular characteristics. The hypothesis is that a specialized protocol reduces molecular degradation and preserves critical plasma components during extended storage.

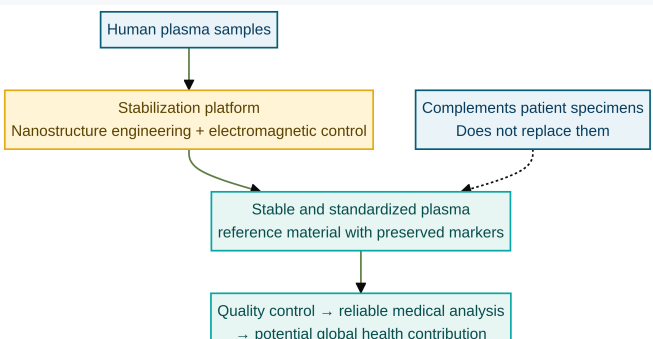
OBJECTIVE

To evaluate preservation efficiency, compositional consistency, and analytical performance of stabilized human plasma across time and storage conditions, with emphasis on glycemia, creatinine, urea, triglycerides, and cholesterol.

MATERIALS & METHODS

Ninety human plasma samples were divided into three cohorts: healthy participants (n = 30), participants with metabolic or renal disorders (n = 30), and standard controls (n = 30). Samples were prepared for stabilization and comparative biochemical assessment. The approach combines nanostructure engineering, electromagnetic stabilization, and advanced analytical platforms.

INNOVATION PATHWAY



KEY FINDINGS

Time-course monitoring demonstrated improved marker stability and analytical consistency compared with untreated samples. The supplied source presents descriptive trajectories across storage durations up to 90 days; no additional statistical estimates were provided.

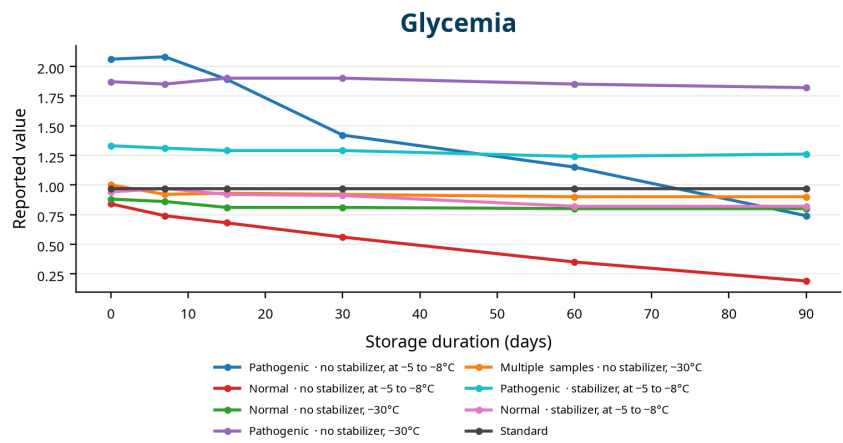
DISCUSSION & APPLICATION

Degradation and variability of biological calibration or quality-control materials can reduce long-term comparability of laboratory measurements. The proposed platform provides a consistent baseline for analytical verification and quality control. It is designed to complement routine testing—not replace patient samples—by supporting performance verification and reducing analytical variability.

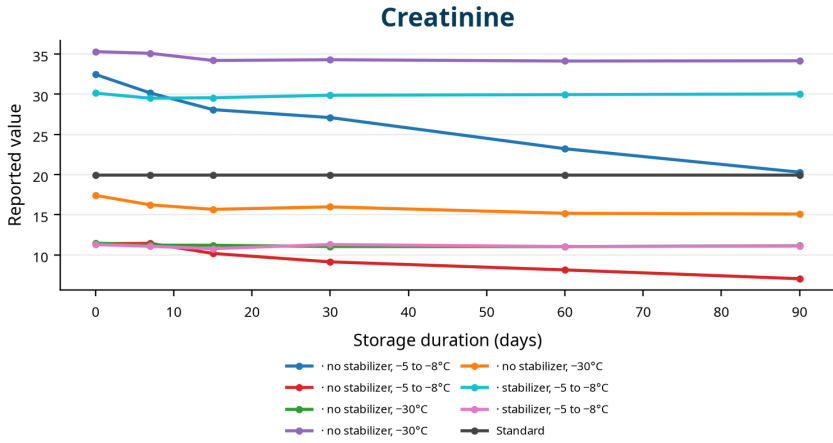
CONCLUSION & IMPLICATIONS

The approach demonstrates potential for stabilized human plasma to serve as a consistent reference material for analytical precision, quality control, and inter-laboratory reproducibility. Future work should quantify statistical significance, validate the protocol across laboratories, and evaluate applications in clinical diagnostics and personalized healthcare.

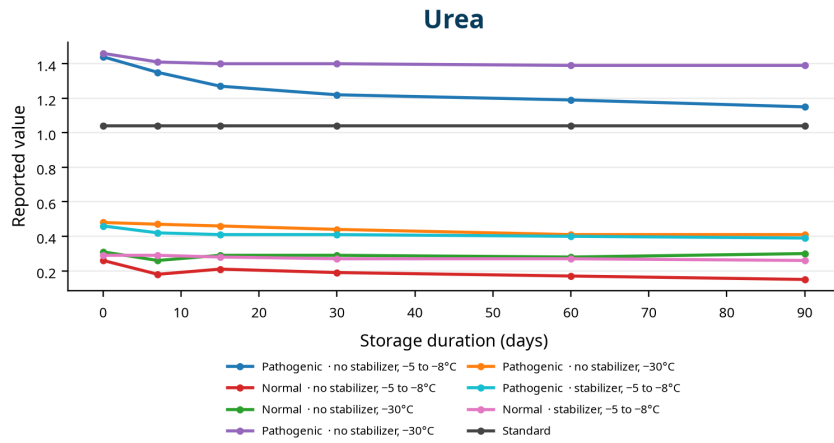
RESULTS · TIME-COURSE MARKER TRAJECTORIES



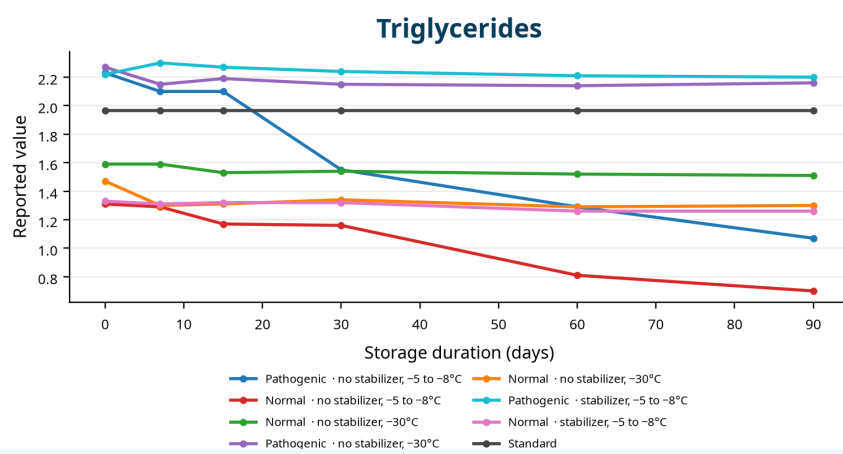
Glycemia



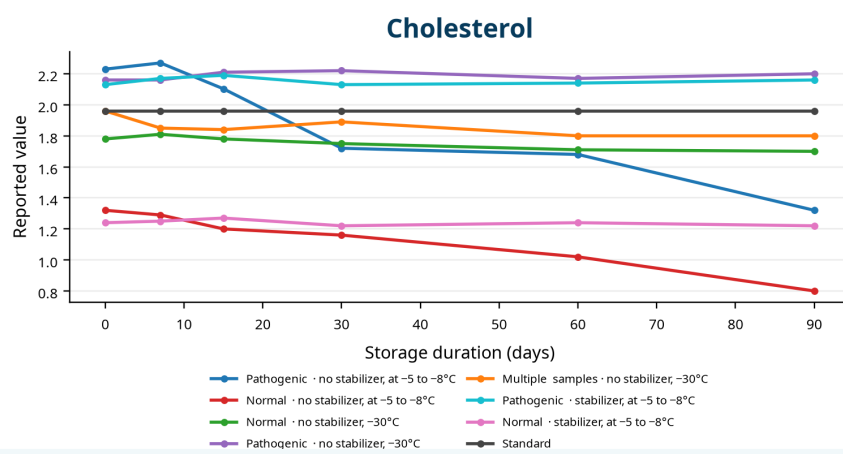
Creatinine



Urea



Triglycerides



Cholesterol

GLOBAL HEALTH IMPACT · GHF RELEVANCE

Reliable laboratory measurement is a foundation of effective care, disease surveillance, and equitable access to health services. By reducing pre-analytical variability and supporting standardized reference material, this innovation could help laboratories compare results more consistently across sites and settings, strengthen quality assurance, and support evidence-based decisions. Its value is not to replace patient specimens, but to build a practical bridge between advanced science and more dependable diagnostics. In the spirit of the Geneva Health Forum, it addresses a shared global challenge through standardization, collaboration, and innovation that can be adapted to diverse health systems.

REFERENCES AND SOURCE MATERIAL

[1] User-provided research text: Stable and Standardized Human Plasma: From Diagnostic Precision to Future Personalized Therapies. [2] User-provided reference poster: Optimization of Human Plasma Preservation Method as a Standard for Biological Analysis. [3] The biomarker curves in this poster are reproduced from the supplied reference poster and are not recalculated or statistically re-estimated here.

