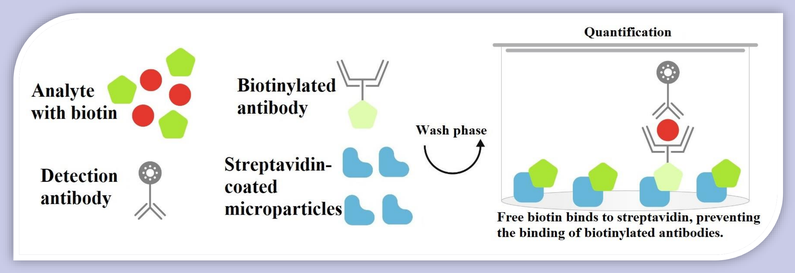
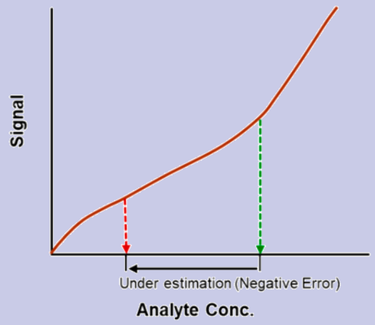
Biotin in Diagnostics: Recognizing Interference and Methods for Its Prevention

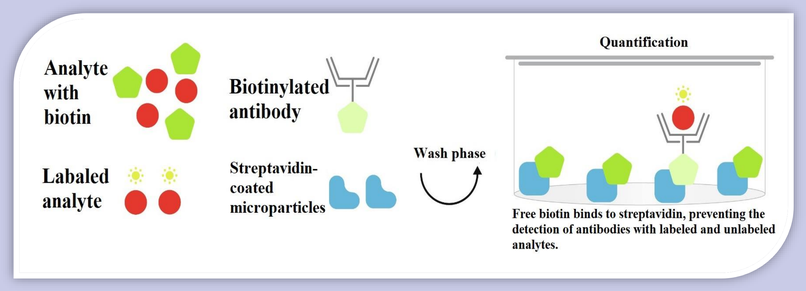
The increasing use of biotin as a supplement and therapeutic agent has led to significant challenges in laboratory diagnostics, particularly in immunoassays utilizing **biotin-streptavidin technology**. Biotin interference can produce **inaccurate results**, leading to **misinterpretations and inappropriate clinical management**. Elevated biotin concentrations bind to streptavidin, disrupting the interaction between antibodies and target analytes. This results in **falsely elevated values in competitive immunoassays** and **falsely decreased values in non-competitive assays**.

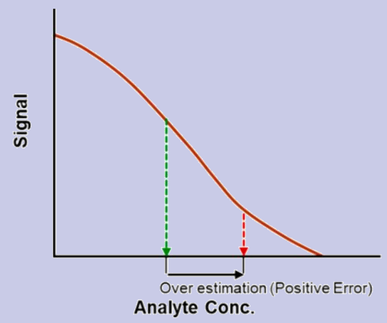
Mechanism of interference in sandwich immunoassay:





Mechanism of interference in competitive immunoassay:





Impact of Biotin on Hormonal and Cardiac Markers

TSH, PTH *falsely* ↓

Thyroid autoantibodies, fT3, fT4 *falsely* ↑

Testosterone *falsely* ↑

Cardiac troponins *falsely* ↓

01 Raising Awareness

represents the first and significant step in risk reduction; therefore, it is necessary to develop educational strategies for healthcare professionals and patients.

02 Serial Dilution

The first step in laboratory practice when biotin interference is suspected. By reducing the concentration of biotin in the sample and adjusting the analyte concentration relative to the degree of dilution, more accurate results are obtained.

03 Biotin Elimination

Because the elimination period varies among patients, it is recommended to discontinue biotin intake at least 48 hours before blood sampling for laboratory tests to avoid potential interference.

04 Biotin Depletion

Protocols for biotin removal involve using materials that bind to biotin and eliminate it from the sample before testing is performed.

David Z. Strilić[1] , Bojan G. Stanimirov[2], Maja P. Đanić[3]

[1] *Faculty of Medicine, University of Novi Sad, Novi Sad, Serbia* [2] *Department of Biochemistry, Faculty of Medicine, University of Novi Sad, Novi Sad, Serbia* [3] *Department of Pharmacology, Toxicology and Clinical Pharmacology, Faculty of Medicine, University of Novi Sad, Novi Sad, Serbia*