

## Establishing thresholds and effects of gender, age, and season for thyroglobulin and thyroid peroxidase antibodies by mining real-world big data

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### Abstract

**Background:** Thyroglobulin antibody (TG-Ab) and thyroid peroxidase antibody (TPO-Ab) are cornerstone biomarkers for autoimmune thyroid diseases, and establishment of appropriate thresholds is crucial for physicians to appropriately interpret test results. Therefore, we established the thresholds of TG-Ab and TPO-Ab in the Chinese population through analysis of real-world big data, and explored the influence of age, gender, and seasonal factors on their levels.

**Methods:** The data of 35,869 subjects downloaded from electronic health records were analyzed after filtering based on exclusion criteria and outliers. The influence of each factor on antibody levels was analyzed by stratification. Thresholds of TG-Ab and TPO-Ab were established through Clinical Laboratory Standards Institute document C28-A3 and National Academy of Clinical Biochemistry (NACB) guidelines, respectively.

**Results:** There were significant differences according to gender after age stratification; the level of TG-Ab gradually increased with age in females. There were significant differences in TG-Ab and TPO-Ab distributions with respect to age after gender stratification. Moreover, differences were observed between seasons for TG-Ab and TPO-Ab. The thresholds of TG-Ab and TPO-Ab were 107 [90% confidence interval (CI):101–115] IU/mL and 29 (90% CI: 28–30) IU/mL, respectively, using C28-A3 guidelines, but were 84 (90% CI: 50–126) IU/mL and 29 (90% CI: 27–34) IU/mL, respectively, using NACB guidelines.

**Conclusion:** The levels of TG-Ab and TPO-Ab were significantly affected by gender, age, and season. The thresholds for TG-Ab and TPO-Ab for the Chinese population were established by big data analysis



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### Speaker Publications:

1. “Gold Nanoparticles Supported on Carbon Derived from Solid Olive Waste for Epoxidation of Cyclooctene”; *Asian J. Chem.* / 2018 / 30(8) /pp 1731-1735
2. “Adsorption, kinetic and thermodynamic studies of safranin and methylene blue on a novel adsorbent based on phosphorylated sawdust”; *Desalination and Water Treatment/ Vol 151 (2019) 199–211*
3. “Green synthesis of spongy Nano-ZnO productive of hydroxyl radicals for unconventional solar-driven photocatalytic remediation of antibiotic enriched wastewater”; *Journal of Environmental Management/ Vol 271, 2020, 110961.*

4. "Sulfhydryl functionalized activated carbon for Pb(II) ions removal: kinetics, isotherms, and mechanism"; Journal of Separation Science and Technology/ Vol 55, 2020- Issue 7
5. "Recyclable glutaraldehyde cross-linked polymeric tannin to sequester hexavalent uranium from aqueous solution"; Journal of Molecular Liquids/ Vol 281, 2019, Pages 29-38.

[7<sup>th</sup> International Conference on Big Data Analysis and Data Mining](#) -July 17-18, 2020 Webinar.

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