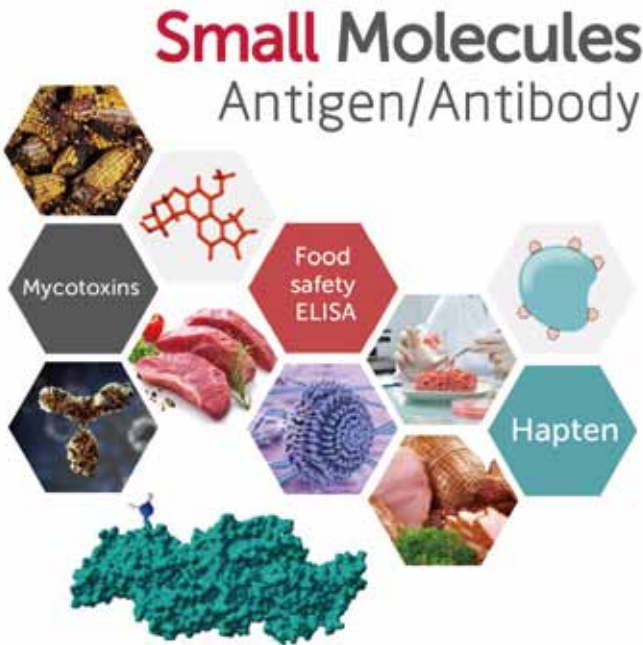
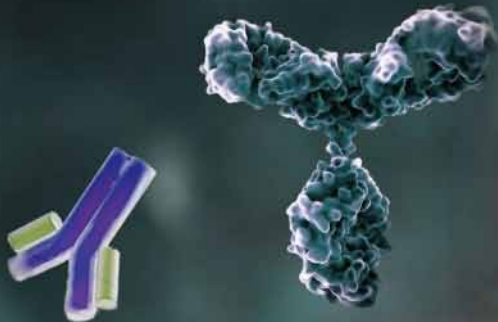


SMALL MOLECULES

Antigen/Antibody



Haptens, also known as incomplete antigens, are small molecules that can bind to the antibody, but will usually not initiate an immune response alone. It only has immunoreactivity, no immunogenicity.

However, it can elicit an immune response and produce the antibody when attached to a large carrier such as a protein.

Most polysaccharides and all lipids are haptens. Some small substances (such as vitamins, antibiotics, drugs, etc.) with specific structure called simple hapten.

When simple hapten gets into the body of allergies, it can combine with the tissue protein and become complete antigen which can cause hypersensitivity.

In general, B lymphocytes recognize hapten epitopes and T lymphocytes recognize carrier epitopes.

Small Molecules

+ Vitamins

- Vitamin A
- Vitamin B1, B2, B3, B7
- Vitamin B7/Biotin
- Vitamin B9/Folic Acid
- Vitamin B12
- Vitamin C
- 25-OH Vitamin D
- 1,25 (OH)₂ Vitamin D3
- Vitamin E
- Vitamin K1

+ Drugs of Abuse

- Acetamiprid
- Acetochlor
- Carbaryl
- Carbendazim
- Chlorothalonil
- Chlorpyrifos
- Clonazepam
- Diazepam
- Dihydrochlorothiazide
- Fenpropathrin
- Imidacloprid
- Nitrazepam
- Parathion methyl

+ Hormones

- 19-Norandrosterone
- Bisphenol a
- Estradiol
- Hydrocortisone
- Methyltestosterone
- Nonylphenol
- Tetrabromobisphenol A
- Polybrominated diphenyl ether
- Ractopamine
- Testosterone

+ Therapeutic Drugs

- Carbamazepine
- Digoxin
- L-Norephedrine
- Phenytoin
- Theophylline
- Valproic Acid

+ Mycotoxins

- Aflatoxin B1
- Aflatoxin M1
- Aflatoxin
- Ochratoxin
- Zearalenone
- Fumonisin
- T-2 toxin

+ Antibiotics

- Sulfadiazine
- Sulfaquinoxaline
- Sulfamethazine
- Sulfadimethoxine
- Trimethoprim
- Chloramphenicol
- Kanamycin
- Streptomycin
- Neomycin
- Erythrocin
- Spectinomycin
- Fluoroquinolones
- Avermectin
- Tylosin
- Tilmicosin
- Vancomycin
- Salinomycin
- Monensin
- Tetracycline
- Olaquinox
- Sarafloxacin
- Ofloxacin
- Enrofloxacin