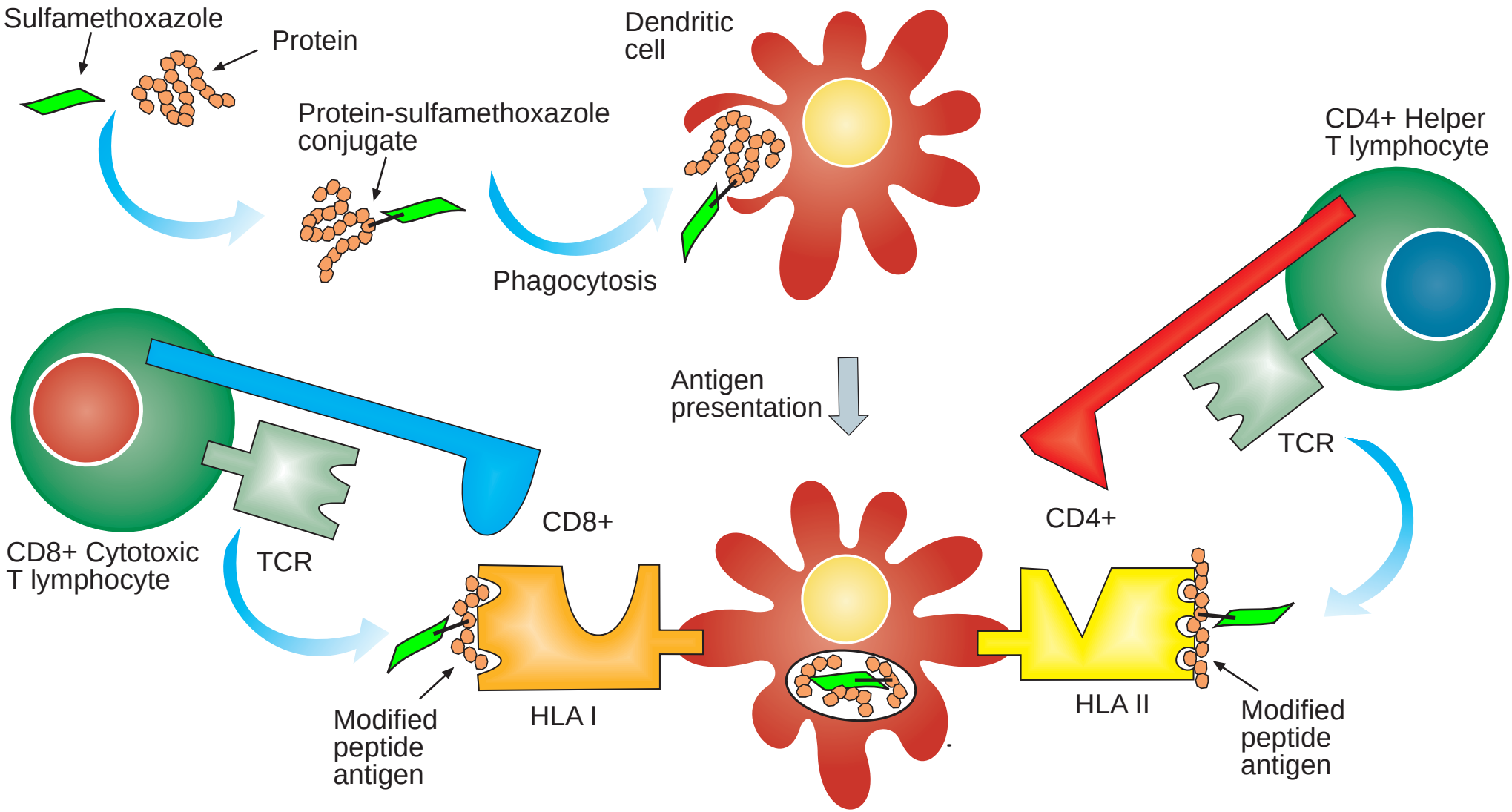
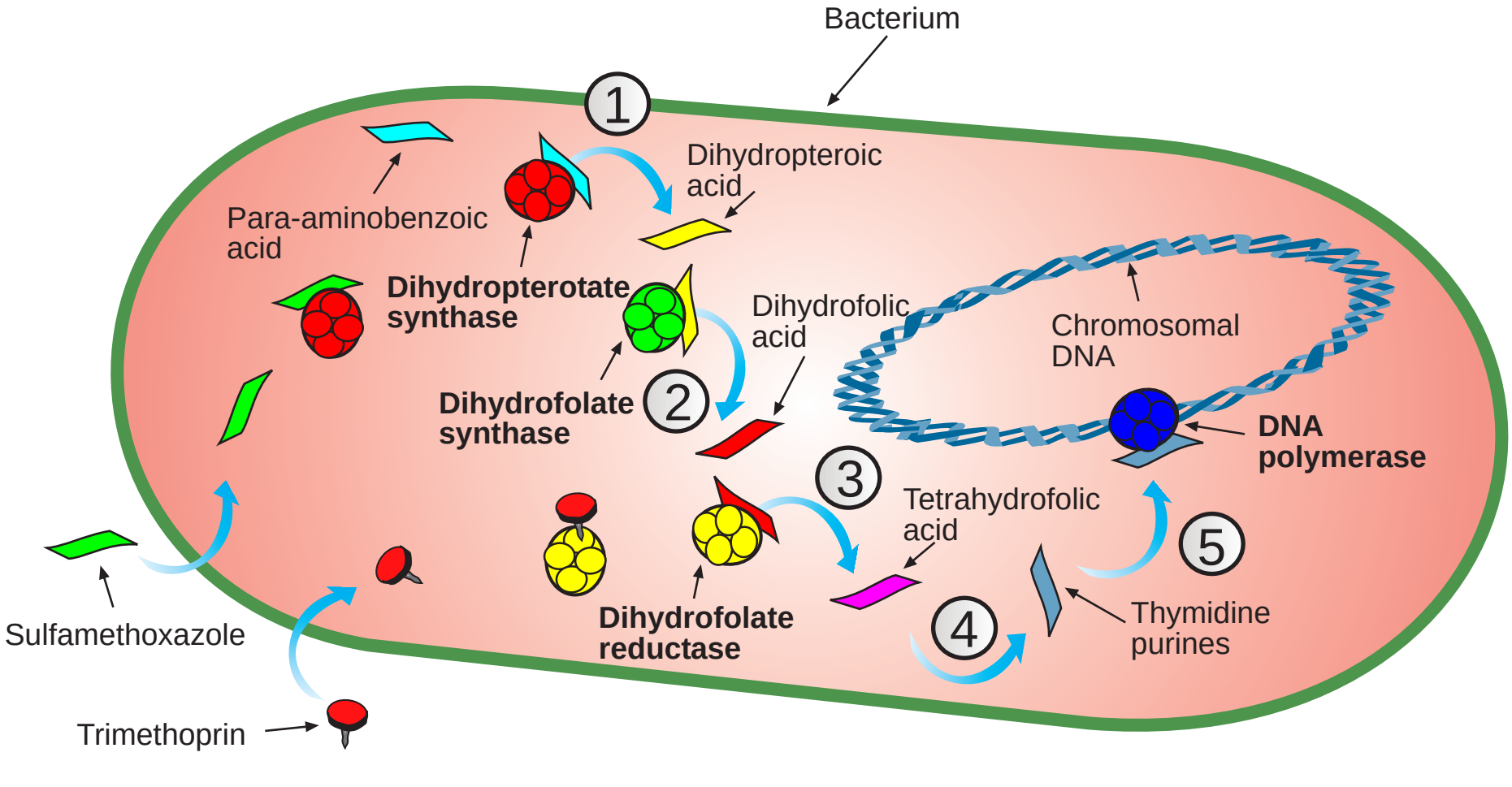
Immune hypersensitivity reaction to Sulfamethoxazole



In the “hapten” model for immune hypersensitivity reactions to drugs such as sulfamethoxazole, the drug is first bioactivated which allows it to covalently attach to a cellular protein. Bioactivation is a chemical modification of the drug carried out in the cell by either cytochrome P450, myeloperoxidase or prostaglandin H synthase. The protein-drug conjugate upon release from the cell is processed by an antigen presenting cell, such as a dendritic cell, which displays peptides on class I and II HLA receptors. T lymphocytes that bind the modified antigen via the TCR are then activated.

Drug action: Trimethoprin and Sulfamethoxazole



Trimethoprin and sulfamethoxazole act in synergy to restrict the growth of bacteria by interfering with the enzymatic processes involved in the synthesis of thymidine required for DNA replication. (1) Sulfamethoxazole is a competitor of para-aminobenzoic acid which is converted to dihydropteroic acid by **dihydropterotate synthase**. (2) Dihydropteroic acid is converted to dihydrofolic acid by **dihydrofolate synthase**. (3) Trimethoprin inhibits **dihydrofolate reductase** that converts dihydrofolic acid to tetrahydrofolic acid. This is used to (4) synthesise thymidine required for (5) DNA replication.