The shikimate pathway is a metabolic route in plants and microorganisms that converts erythrose 4-phosphate and phosphoenolpyruvate into chorismate, a key precursor for synthesizing aromatic amino acids (tryptophan, tyrosine, and phenylalanine), folates, and other essential compounds. It is absent in animals, making it an important target for herbicides like [glyphosate](https://www.google.com/search?sca_esv=f1b1fe1a0ad9e49d&rlz=1C1GCEA_enUS1064US1064&q=glyphosate&sa=X&sqi=2&ved=2ahUKEwj0vqCWocuQAxUoTjABHZ18NSsQxccNegQITRAB&mstk=AUtExfDPvWB1FdQdwdeMDg9NvyoMjYmjNN2ZCf1d9ES2RyAZgrX-LiXWpAMV6VMUkdiiJ7b1Cy7RmW7NOi8v85Dt6fpB91_coLrfV0j_rHOIx9g9kmxAwFHc3WHVnHLLLMFGPDHGmJ81Kkd4FOQcxE373xLJnuYVbHwmcTqDFyq6DsqPjX6NlczsGTFdWOni3DiYWLeY&csui=3) and for the development of [antimicrobials](https://www.google.com/search?sca_esv=f1b1fe1a0ad9e49d&rlz=1C1GCEA_enUS1064US1064&q=antimicrobials&sa=X&sqi=2&ved=2ahUKEwj0vqCWocuQAxUoTjABHZ18NSsQxccNegQITRAC&mstk=AUtExfDPvWB1FdQdwdeMDg9NvyoMjYmjNN2ZCf1d9ES2RyAZgrX-LiXWpAMV6VMUkdiiJ7b1Cy7RmW7NOi8v85Dt6fpB91_coLrfV0j_rHOIx9g9kmxAwFHc3WHVnHLLLMFGPDHGmJ81Kkd4FOQcxE373xLJnuYVbHwmcTqDFyq6DsqPjX6NlczsGTFdWOni3DiYWLeY&csui=3).

**Key aspects of the shikimate pathway**

* **Function:**

It provides the building blocks for several essential classes of compounds.

* + **Aromatic amino acids:** The pathway's final product, chorismate, is converted into phenylalanine, tyrosine, and tryptophan.
  + **Other compounds:** It is also a precursor for folates, ubiquinone, and various plant hormones and secondary metabolites.
* **Location:**

The pathway is found in plants, bacteria, and fungi, but not in animals.

* **Significance:**
  + **Agriculture:** The pathway is targeted by herbicides like glyphosate, which inhibits one of its enzymes (5-enolpyruvylshikimate-3-phosphate synthase), making it a valuable tool for weed control.
  + **Medicine:** Its absence in animals means that inhibiting this pathway in microbes or parasites could be a way to develop effective antimicrobial or antiparasitic drugs with fewer side effects on humans.
* **Metabolic connections:**

It connects two central metabolic pathways: glycolysis and the pentose phosphate pathway.

* **Regulation:**
  + **Microorganisms:** Regulated by feedback inhibition, where the end products of the pathway inhibit early enzymes.
  + **Plants:** Regulation appears to be primarily at the genetic level, with no identified physiological feedback inhibitor.