Excellent and precise question — and yes, **glyphosate exposure can indeed shut off, deactivate, or diminish the function of the shikimate pathway** in affected plants. Let’s break this down clearly and mechanistically:

**🧬 1. How Glyphosate Interferes with the Shikimate Pathway**

Glyphosate specifically targets and **irreversibly inhibits** a key enzyme called **5-enolpyruvylshikimate-3-phosphate synthase (EPSPS)** — the seventh enzyme in the **shikimate pathway**, which is vital for synthesizing aromatic amino acids.

* **Normal function:**  
  The pathway converts simple carbohydrates (from photosynthesis) into **shikimate**, then **chorismate**, which is used to produce:
  + **Tryptophan**
  + **Phenylalanine**
  + **Tyrosine**
* **With glyphosate present:**  
  Glyphosate **binds tightly to EPSPS**, preventing it from working.  
  This **halts the entire shikimate pathway**, causing:
  + A **buildup of shikimate** and other intermediates (a biochemical marker of glyphosate exposure).
  + A **shortage of aromatic amino acids**, which are essential for proteins, growth regulators, and plant defense compounds (like lignin, flavonoids, and phytoalexins).

**⚙️ 2. Functional Consequences of Shikimate Pathway Shutdown**

When EPSPS is blocked and the pathway collapses:

* **Protein synthesis slows or stops** because the plant can’t make the necessary amino acids.
* **Photosynthesis and respiration efficiency drop**, since several coenzymes and pigments derive from aromatic amino acids.
* **Cell wall and vascular development weaken**, due to reduced lignin production.
* **Defense mechanisms fail**, as many plant immune and signaling molecules come from the shikimate pathway.

Result:  
The plant enters **metabolic failure**, visible as **yellowing, leaf curling, necrosis**, and ultimately **death** — especially at growing tips, where amino acid demand is highest.

**⏱ 3. Temporary vs. Permanent Effects**

* **Sub-lethal exposure (light drift or dilution):**  
  The inhibition may be **partial or temporary**. If glyphosate concentrations fall or the plant metabolically compartmentalizes it, **some EPSPS activity can recover**, and the shikimate pathway resumes — though weakened.  
  → The result is **stunted growth**, **reduced vigor**, and **lower yield**, but not always death.
* **Moderate to high exposure:**  
  EPSPS is **irreversibly bound**, the enzyme is rendered **nonfunctional**, and **new EPSPS cannot be synthesized** (since amino acid synthesis has halted).  
  → The pathway remains **shut off permanently**, leading to **cell death and tissue necrosis**.

**🧫 4. Biochemical Evidence**

Researchers measure the **accumulation of shikimic acid** in plant tissue as proof that glyphosate has disrupted the pathway. Elevated shikimate levels indicate:

* EPSPS is inhibited.
* The pathway is nonfunctional.
* The plant’s primary metabolism is collapsing.

**🌿 5. No Resistance = Total Vulnerability**

In **non-Roundup-Ready plants**, there is **no alternative EPSPS enzyme**. Roundup-Ready crops were engineered to express a **bacterial EPSPS** (from *Agrobacterium sp. strain CP4*) that is **glyphosate-insensitive**, allowing the shikimate pathway to continue operating.  
Without this modification, a susceptible plant has **no biochemical workaround**, so even brief or minor exposure can **partially or completely deactivate** the pathway.

✅ **In summary:**  
Yes — **glyphosate exposure directly deactivates the shikimate pathway** by binding to and disabling the EPSPS enzyme.  
This **blocks amino acid synthesis**, disrupts plant metabolism, and can **either temporarily diminish or permanently shut down** the pathway, depending on dose and duration.