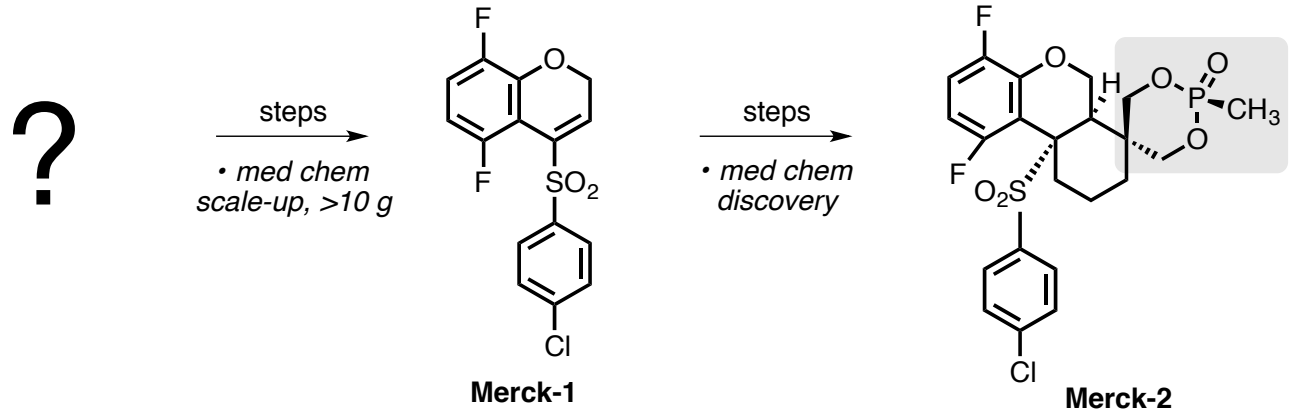
Merck recently disclosed a series of γ-secretase inhibitors (GSIs) that were assessed in a nontransgenic animal model of Alzheimer's disease, demonstrating reduction of amyloid-β in the central nervous system after acute oral dosing. Their most promising compound, **Merck-2**, elaborated upon a previous lead, **Merck-1**. **Merck-1** was the starting point in a medicinal chemistry discovery effort, leading to a new spirocyclic series, including **Merck-2**.

Part 1. Working in teams, propose a retrosynthesis and forward synthesis of **Merck-1** that is *concise and scalable*. All starting materials in your synthesis must be available from any reputable commercial supplier in ≥5 g scale.

Part 2. Propose a *medicinal chemistry route* to **Merck-2** and at least 3 other *spirocyclic* analogs (varying the group in gray) using reagents available from a reputable commercial supplier on any scale.

You are only permitted to use a computer to search emolecules.com or vendor websites for commercial availability.



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