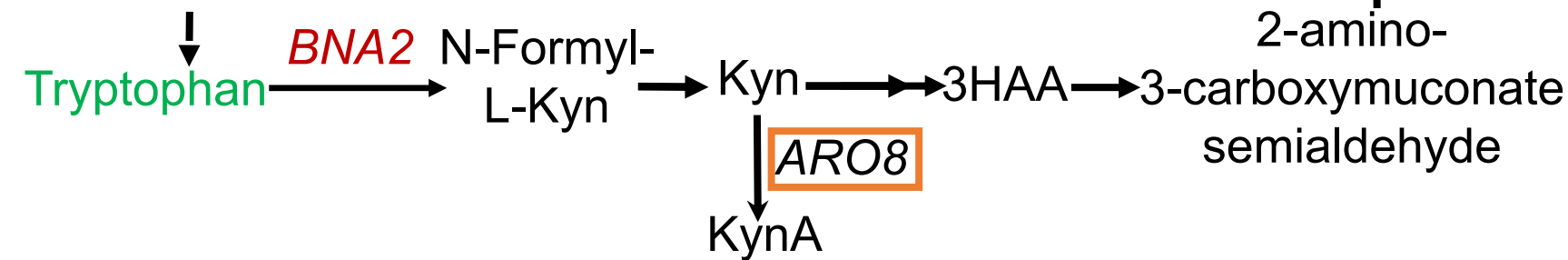
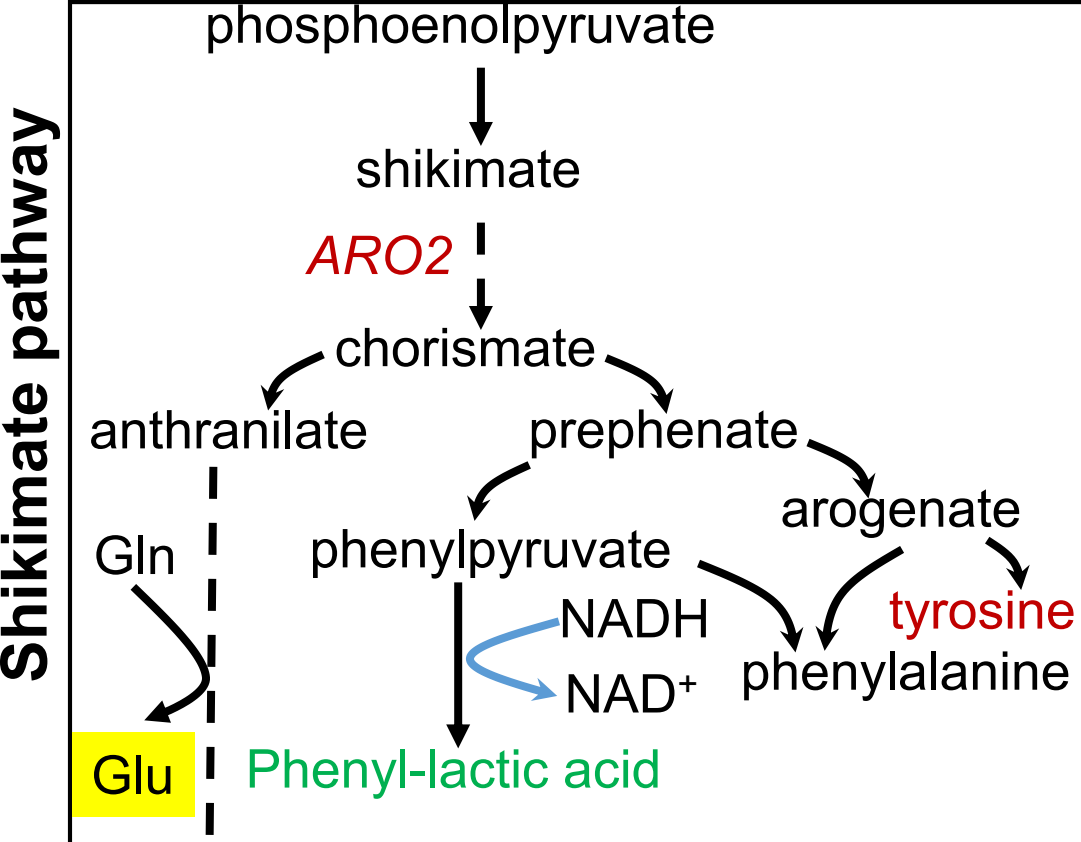


Shikimate pathway



De novo NAD⁺ synthesis

α -ketoadipate

Quinolinic
Acid

2-amino-

3-carboxymuconate
semialdehyde

3HAA

Kyn

N-Formyl-
L-Kyn

BNA2

Tryptophan

Glu

Gln

QNS1

NaAD

NaMN

NA

PNC1

NaM

NAD

Salvage pathway