

Biochemical Cue  
(e.g., IL-12)

Receptor  
(R)

**Cue-Signal-Response  
Model**

Signaling  
Protein 1  
(S1)

RS1  
Complex

Inactive  
Signaling  
Protein 2  
(I)

$k_a$

Active  
Signaling  
Protein 2  
(A)

$k_d$

Deactivating  
Protein (D)

Cellular  
Response (CR)  
(e.g., Cytokine  
Production)

