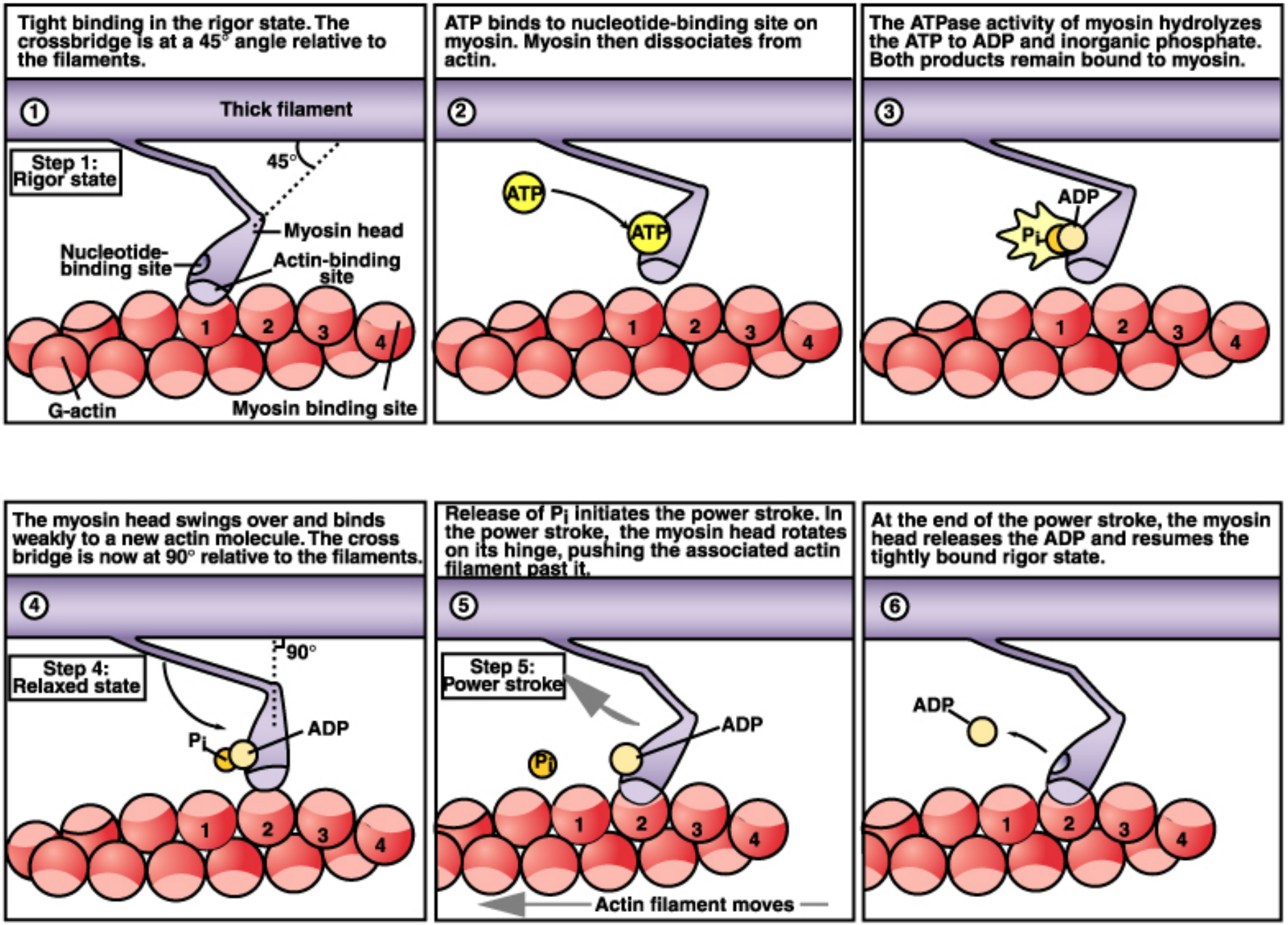
Tight binding in the rigor state. The crossbridge is at a 45° angle relative to the filaments.
1
Thick filament
Step 1: Rigor state
45°
Myosin head
Nucleotide-binding site
Actin-binding site
1
2
3
4
G-actin
Myosin binding site
ATP binds to nucleotide-binding site on myosin. Myosin then dissociates from actin.
2
ATP
ATP
1
2
3
4
The ATPase activity of myosin hydrolyzes the ATP to ADP and inorganic phosphate. Both products remain bound to myosin.
3
ADP
Pi
1
2
3
4
The myosin head swings over and binds weakly to a new actin molecule. The cross bridge is now at 90° relative to the filaments.
4
Step 4: Relaxed state
90°
Pi
ADP
1
2
3
4
Release of Pi initiates the power stroke. In the power stroke, the myosin head rotates on its hinge, pushing the associated actin filament past it.
5
Step 5: Power stroke
ADP
Pi
1
2
3
4
Actin filament moves
At the end of the power stroke, the myosin head releases the ADP and resumes the tightly bound rigor state.
6
ADP
1
2
3
4