# Program Design for Maximal Hypertrophy

# 6

This chapter builds on the information from previous chapters to explore the practical application of the science of hypertrophy training. Considerations for exercise selection are discussed from a biomechanical standpoint with a focus on how movements can be synergistically varied to ensure complete muscular development. A discussion of program design follows that details the nuances of manipulating program variables over the course of a periodized training cycle to maximize the hypertrophic response. Numerous examples are provided throughout the chapter to illustrate the practical application of relevant concepts. It is important to understand that these examples represent the art of program design and are for illustrative purposes only. While paying proper attention to underlying scientific principles, lifters should harness their personal experience in conjunction with their own needs and abilities to formulate a strategic plan. This is the essence of an evidence-based approach to training.

## Biomechanics

Biomechanics is the study of how internal and external forces affect the living body; particular attention is given to the musculoskeletal system. A variety of biomechanical factors must be taken into account when choosing exercises for a hypertrophy-oriented program. These include the length–tension relationship, training angle, plane of movement, spacing of hands and feet, and exercise type, which are addressed in this section. The ensuing section, Exercise Selection Strategies, explores how to apply these factors to resistance training program design to maximize hypertrophy.

**KEY POINT**

Length–tension relationship, training angle, plane of movement, spacing of hands and feet, and exercise type can all be carefully manipulated in program design to maximize hypertrophy.

### Length–Tension Relationship

The capacity of a muscle fiber to produce force is predicated on the position of the actin and myosin filaments in its sarcomeres. This phenomenon, known as the *length–tension relationship* (figure 6.1), can be harnessed to target muscles or portions thereof by making them more or less active during exercise. Two primary strategies are applicable here: active insufficiency and passive tension. *Active insufficiency* refers to when a two-joint muscle is shortened at one joint while a muscular action is initiated at the other joint. Because a muscle loses the ability to shorten when its attachments are close together, it is in a functionally disadvantageous position on the length–tension curve, resulting in a diminished capacity to produce force. For example, in the flexed position of the biceps curl, the biceps