

A Conversation with Brad Schoenfeld, MSc, CSCS

Question: With respect to your book, "The M.A.X. Muscle Plan," you say "MAX" is an acronym for "Mitogen-Activated Xtreme" training. In layman's terms, can you give our listeners a brief overview of what mitogens are, what "The M.A.X. Muscle Plan" is, and what sets it apart from other programs?

Brad: Mitogens are substances produced in the body that promote growth. "The M.A.X. Muscle Plan" is designed to maximize production of these growth-promoting substances, as well as other anabolic factors, in order to achieve optimal muscular development. What sets "The M.A.X. Muscle Plan" apart from other books is its scientific approach. I've been studying the mechanisms of muscle-building for over a decade. It was my area of interest for my master's thesis and is now the focus of my doctoral research. I've harnessed all the current science and then combined it with my many years of experience working with a wide variety of clients including many high level physique athletes to develop the M.A.X. Muscle program. It's taken me years to perfect the system, and I'm really pleased to be able to offer it to the public in the form of this book.

Question: You talk a lot about periodization in the book. How does periodization help a person structure an exercise program that allows him or her to make ongoing progress and avoid those dreaded training plateaus? And how big of a role does periodization play in "The M.A.X. Muscle Plan"?

Brad: For those who don't know, periodization refers to the manipulation of training variables (such as reps, sets, and rest intervals), which are varied over time to optimize a training effect. In this case, periodization is employed to promote maximal muscle hypertrophy. The entire 6-month routine is periodized in a way that each phase builds upon the previous one so that the trainee ultimately achieves maximal muscle growth by the end of the macrocycle. One of the primary ways this is accomplished is by systematically increasing training volume throughout the program. Volume has been shown to be perhaps the most important factor in hypertrophy. At least up to a certain point, a greater volume leads to greater gains in size. Problem is, if you constantly train with high volumes you'll rapidly become overtrained, which results in the dreaded plateau. In "The M.A.X. Muscle Plan," the increases in volume are interspersed with periods of "deloading" where both volume and

intensity are decreased. This provides the optimal balance of training and recovery so that gains continue over time.

Question: Many people believe their genetic makeup will either help them greatly or hinder their abilities to build muscle. How important are genetics to a person's muscle-building potential?

Brad: Genetics are always a huge factor. Studies show they account for up to about 50% of a person's ultimate muscular potential. But that certainly shouldn't discourage anyone. You are still in control of at least 50% of your gains. And this makes it even more important for those who have difficulty packing on mass to train scientifically. I've worked with a lot of people over the years who told me they simply couldn't get bigger, and when I put them through the program outlined in the book they were able to gain significant muscle in a fairly short period of time.

Question: How do the results one sees from "The M.A.X. Muscle Plan" differ based on their training status?

Brad: As a general rule, relatively untrained individuals will see more rapid gains than those who are more well-trained. The more experience you have with performing intense resistance training, the closer you are to your ceiling for growth and therefore the more difficult it becomes to add substantial mass. That said, I've worked with elite natural physique athletes who have gained around 6 pounds by the end of the 6-month program, whereas they'd previously said they'd reached a plateau. Someone who is untrained or coming back after a layoff from training can often achieve double that amount of growth.

Question: How can muscle soreness actually be beneficial to muscle development?

Brad: It's not the soreness, per se, that can be beneficial but rather the underlying cause of the soreness which is muscle damage. There is compelling evidence that some muscle damage is "good," in the sense that it promotes remodeling of muscle tissue, where the muscle ends up stronger than it was before. On the other hand, too much damage impairs remodeling and limits your ability to train. Think of it like getting a suntan: If you stay within the capacity for your skin to adapt, you'll get a nice tan. If you overdo it, you burn.

So with this as background, we can say that mild soreness *probably* indicates you've set the stage for muscle growth. But a lack of soreness doesn't necessarily mean you haven't. Bottom line: Don't use soreness as a definitive gauge of a good workout.

Question: What are "satellite cells," how do they function in a similar way to stem cells, and why are they so important to maximizing muscle development?

Brad: Before answering that question, a little background info is necessary. The basis of muscle growth is achieved by a process called protein synthesis, which takes place in the nucleus of the muscle fibers. Muscles are multinucleated, meaning they have many nuclei, and this allows them to carry out sufficient protein synthesis that's required during normal daily living. However, when a person lifts weights intensely, the amount of nuclei that you have are not sufficient to support continued growth. This is where satellite cells come into play. Satellite cells are basically unspecialized muscle stem cells that get called upon to become active when needed. During intense resistance training, satellite cells become activated and then fuse to muscle fibers where they donate their nuclei so that muscles can produce more protein. "The M.A.X. Muscle Plan" is designed to heighten satellite cell activity, primarily through the release of mitogens, and thus ensure the continued capacity for muscles to grow.

Question: In the book you talk about the three primary mechanisms involved in exercise-related muscle growth. Can you talk a little about those?

Brad: My masters thesis was titled, "The Mechanisms of Muscle Hypertrophy and their Application to resistance training", which by the way ended up getting published in the Journal of Strength and Conditioning Research. In this paper, I outlined that muscle growth from resistance exercise can be attributed to three primary factors: 1) Mechanical tension, which is basically the forces exerted on a muscle. 2) Metabolic stress, which involves the buildup of metabolites associated with intense exercise such as lactate and hydrogen ions, and 3) Muscle damage, which I discussed a moment ago. Of the three, mechanical tension appears the dominant factor in muscular hypertrophy, at least to a certain degree. Without force exerted on a muscle, there simply isn't a reason for it to adapt and grow. But there's compelling evidence that a threshold exists for tension and once you get beyond this threshold, the other factors can be extremely important in the process. That's why it's

important to train in a variety of rep ranges and manipulate the other program variables such as sets and training frequency if your goal is to achieve maximal growth.

Question: What are some of the hormones and growth factors that have been shown to play a role in muscle development?

Brad: There are literally dozens of them. A good deal of evidence points to a muscle specific form of IGF called mechano growth factor as being important in the growth process, but research is showing that many others are equally if not more important. Current research is focusing on substances that are produced directly by the muscles called myokines. We're still in the early stages of understanding the specific roles of these myokines, but studies show that metabolic stress and muscle damage are involved in their release. This goes back to what we discussed previously about multiple mechanisms being involved in maximizing muscle growth, and lends credence to the fact that getting bigger requires a varied approach.

Question: Why do you consider planning to be the most important factor in a person reaching his or her muscle-building goals?

Brad: I liken the situation to going on a road trip without knowledge of how to get to your destination. I think we can all agree this would be a highly inefficient way to travel and you're very likely to get lost. Same thing with exercise. If you go into the gym without knowing precisely what you want to accomplish, your workouts are likely to be ineffective in producing the desired response. As I mention in the book, one of my favorite phrases is the old proverb "those who fail to plan, plan to fail." If you don't plan your workouts, you'll ultimately fail to achieve your fitness goals.

Question: Focusing here on something you address in the book, what are your thoughts on training to momentary muscle failure?

Brad: From a muscle-building standpoint, it's important to train to failure at least some of the time. In this way, you maximize inroad and stimulation of all muscle fibers. That said, it's a mistake to take all your sets to the point of momentary muscular failure, particularly when you're performing multiple set routines. I see people in the gym pushing every set to the limit and beyond, thinking that this is the best way to spur growth. But it's a misguided thought process. They inevitably become overtrained, which actually ends up leading to a plateau or

even decrease in results. Bottom line is that you should incorporate failure training into some of your sets, but not all of them. And this should be done in a periodized fashion where unloading cycles are interspersed into the mix to facilitate recuperation.

Question: How important is exercise selection to "The M.A.X. Muscle Plan"?

Brad: There's definitely a benefit to using a variety of exercises for maximizing muscle growth. Free weights, machines, and cables all have certain advantages and disadvantages when it comes to building muscle, and the disadvantages of one tend to be the advantages of the other. Combining these exercises produces a synergistic effect that maximizes results. Same thing with training from multiple angles. Muscles like the deltoids and pectorals are partitioned into separate "heads" that allow you target individual areas of the muscle. Then there are muscles such as the trapezius with upper, middle, and lower regions that can each be activated by different movement patterns. And there is emerging evidence that the majority of muscles are compartmentalized so that many of the fibers do not actually span the entire length of the muscle, which further emphasizes the need for exercise variety.

Question: What are your thoughts on the use and perceived benefits of unstable-surface devices from a muscle-building standpoint?

Brad: As a general rule, unstable surface training should be de-emphasized if the goal is to gain mass. The problem with using unstable surfaces is that it reduces the force you can exert during training. You need to lighten the weights used by up to 50% or more to accommodate the unstable surface. This ultimately reduces the tension on the target muscles, which as discussed is a primary factor for initiating growth. So the take home message is that for hypertrophy-oriented programs, the vast majority of exercises should be performed on stable surfaces.