The Scientific Foundations

Part 1

I was very fortunate because, at the time, I had an almost ideal educational background to understand what **aging** truly is and how to **approach** it. In university I studied **medicine** and later became a **physiatrist** in the regional health district. At the same time, I worked part-time in a **research institute** dedicated to the development of **medical devices**. In my laboratory, radio-electronics and computer engineers worked alongside me, while I represented the **biological** and **medical** side.

To deepen my knowledge of **biology**, I studied in the university's evening biology department and earned my **second degree**.
I was also very lucky because, back then, we studied **Hegelian dialectics** both in high school and at university. The reasoning of **Kant** and **Hegel**, so to speak, cleansed my thinking of metaphysical views and shaped the **clarity** that I consider essential for any **researcher**.

On this website, you'll find my **essays** and **articles** dedicated to **rejuvenation**. My reasoning is based on what I have studied and experienced, but most readers do not have the same background. This is why I decided to describe the basics of **biochemistry**, **physiology**, and **sports pedagogy** in simple terms, to make it easier for users to understand the essential concepts.

All living organic beings are in constant **motion**, even in the deepest sleep, consuming **energy** to sustain **metabolic processes**. So let's begin by discussing the body's **energy systems**.

The force required for life is found in the **ATP molecule**, which releases **energy** when it is converted from **ATP** (adenosine triphosphate) to **ADP** (adenosine diphosphate). ADP is then "recharged" by adding an **inorganic phosphate** group (P): this bond represents stored **energy**.

The most accessible substrate for ATP regeneration is **glucose**, always present in the blood and therefore in every cell. Glucose is like the body's **global currency**, just as the **dollar** is in today's financial system. Other substrates exist—such as **fatty acids** or certain **amino acids**—but they are still closely linked to glucose, which remains the **primary energy base**.

Blood **glucose levels** are a matter of **life or death**. During **stress**, to produce the energy necessary for survival, we need glucose and we burn through it quickly. To keep blood sugar stable, the body draws on **glycogen stores**, a glucose polymer. At the same time, **gluconeogenesis** is activated: the body transforms certain amino acids and other molecules into glucose.

If stress is intense and prolonged, the body begins breaking down its own **tissues** to maintain energy balance and ensure adequate glucose levels. **Adipose tissue**, **skeletal muscles**, and **smooth muscles** of internal organs can all end up in the **energy furnace**. In severe cases, this leads to **gastrointestinal ulcers**, **premature skin aging**, and other disorders.

Even those who don't follow cycling have seen races like the **Tour de France**, where about an hour into the stage, athletes consume **energy drinks** and **food**. Let's see what happens: muscle cells contain **glycogen crystals** and **fat droplets**, which are used during the first hour of riding. When blood glucose drops, **hypoglycemia** demands fuel. If the athlete doesn't eat, they'll go into shock and end up in the **emergency room**. So they must consume **carbohydrates**.

At this point it's useful to debunk a widespread myth: **cardio does not burn fat during the activity itself**.

If a Tour de France cyclist, instead of eating and continuing, simply stopped to rest, after about an hour **gluconeogenesis** would regenerate glycogen and **lipolysis** would release **fatty acids** and **glycerol** from adipose tissue. Muscle fibers would absorb these molecules and the athlete would regain energy. **Fat burning** happens during **recovery**, not during exertion.

It's clear, then, that **adipose tissue** loses mass not during the run but afterward. If someone wants to **lose weight**, after evening **cardio** they should eat only **lean meat** and **vegetables**—no **carbohydrates** and no **fats**. This way, during the night, muscles will use **body fat**—the fat from the **belly** and **hips**—instead of the fat introduced with dinner.