



International Institute  
of Naturopathy

Education with Vision

Distance Learning  
Program  
**Integrative Nutrition  
and Health Consultant**



Module 1

## Dear Participant

### Welcome to Module 1

In this first module we will begin your education by taking a close look at the anatomy of the human body. At this point you have probably already learned some important aspects of nutrition and physiology, but you will be excited to know that this supposedly boring subject is really interesting from a holistic point of view.

First, we will explain how the human body is structured. Then, we'll focus on the different organs and their respective functions within the human body. You will also learn about certain diseases that may affect these organs, and about measures that could be taken to maintain or regain the optimal function of the organs.

Below is a brief overview of the topics included in the first module:

#### Structure of the Human Body

What is included in our cells? Who or rather what supplies the body with energy? We will decipher the secret of the DNA code and much more.

#### Cardiovascular System

What are the reasons for hypertension, strokes, or heart attacks? What effects do arteriosclerotic deposits have, apart from narrowing the blood vessels? How can we prevent the onset of these conditions? What can an affected person do to help in his or her recovery?

#### Respiratory System

What are the functions of the lungs and the bronchia? What are possible health conditions and diseases that may affect this organ? Which measures make sense when facing asthma or bronchitis?

#### Liver

The liver is an extraordinarily versatile organ, which is why it is of utmost importance for our health. This organ produces important substances, stores or converts several substances, and is one of the most important organs for detoxification. But what happens when this organ is overstrained?

#### Gall Bladder

Why is the gall bladder important for our well being? What kind of ailments may affect the gall bladder? How can we support the optimal function of this organ?

#### Pancreas

The pancreas is of utmost importance for digestion and for the production of certain hormones. What are the dangers of a diet high in sugar and fat? Are we able to reverse diabetes?

#### Kidneys

Why do we often call the kidneys the body's own "purification plant"? Why should a doctor examine the kidneys if the patient suffers from hypertension? What role do the kidneys play in the development of osteoporosis?

As some units in this module go into great detail, we will be explaining some pretty technical terms. Those of you who are interested in each and every detail may acquire enough satisfactory information; and those of you with some prior knowledge may find more interesting things to learn. However, even for these topics our goal remains the same ... to keep this course interesting, exciting, and comprehensible ☺.

At the end of each unit there are some didactic questions that summarize the current unit to help you learn the subject matter more easily. If you like, you may use the allocated space to provide your answers. If you prefer not to write directly in the module, feel free to grab a separate sheet of paper or another notebook.

Finally, some words about the final exam: In order to pass the exam it is *not* necessary that you be able to recall all of the technical terms mentioned in the modules, or to recite all of the information given to you from memory. Rather, your answers to the final exam should indicate that you understood both the crucial information of the respective unit and its importance for our health and well being. The didactic questions at the end of each unit are a good guideline for identifying the relevant topics of the final exam. Thus, if you take the time to answer these didactic questions, you'll have a better time on the exam ☺.

We hope you enjoy the reading and learning process. Keep up your enthusiasm!

[Your International Institute of Naturopathy](#)

3. Why do we call the mitochondria the "powerhouses" of the cells?

---

---

---

---

---

---

4. What distinguishes the mitochondria from the endoplasmic reticulum?

---

---

---

---

5. Please explain the connection between the Golgi apparatus and the ER.

---

---

---

6. What do you think? Does every cell type (e.g., liver cells, brain cells, muscle cells, connective tissue cells) have the same amount of mitochondria, or does the amount differ from cell to cell? And if so, please explain why.

---

---

---

---

---

---

---

---

---

---

---



# 1 Liver

The liver is an amazing organ that is responsible for many different tasks in the body. The liver exhibits an exceptional ability to regenerate, as compared with other organs. Even if a doctor were to remove half of the liver, it is able to regrow to its original size. This is only possible, of course, if the remaining part of the organ is healthy.

The liver's ability to regenerate itself is why we don't have to rely on the organs of departed persons for a liver transplantation; the liver can be transplanted from family members – especially when the receiver is a child. In this case, the surgeons remove just part of the donor's liver that is being transplanted to the receiver. If everything goes well, both parts – the remaining part of the donor's liver, and the partial liver that has been transplanted into the receiver – will be able to grow and become complete and functioning organs again. In this way, two livers originate from only one.

## 1.1. Position of the Liver

The liver is located in the upper-right of the abdomen (also: epigastrium), directly below the diaphragm, to which the organ is partly adhered. While the lower edge of the liver runs along the right costal arch, the upper part of the organ extends into the left upper abdomen.

On the lower side of the liver we find the gall bladder. This organ functions as storage for the bile that is produced in the liver. The human body needs this bile for the digestion of fats, which takes place within the colon.

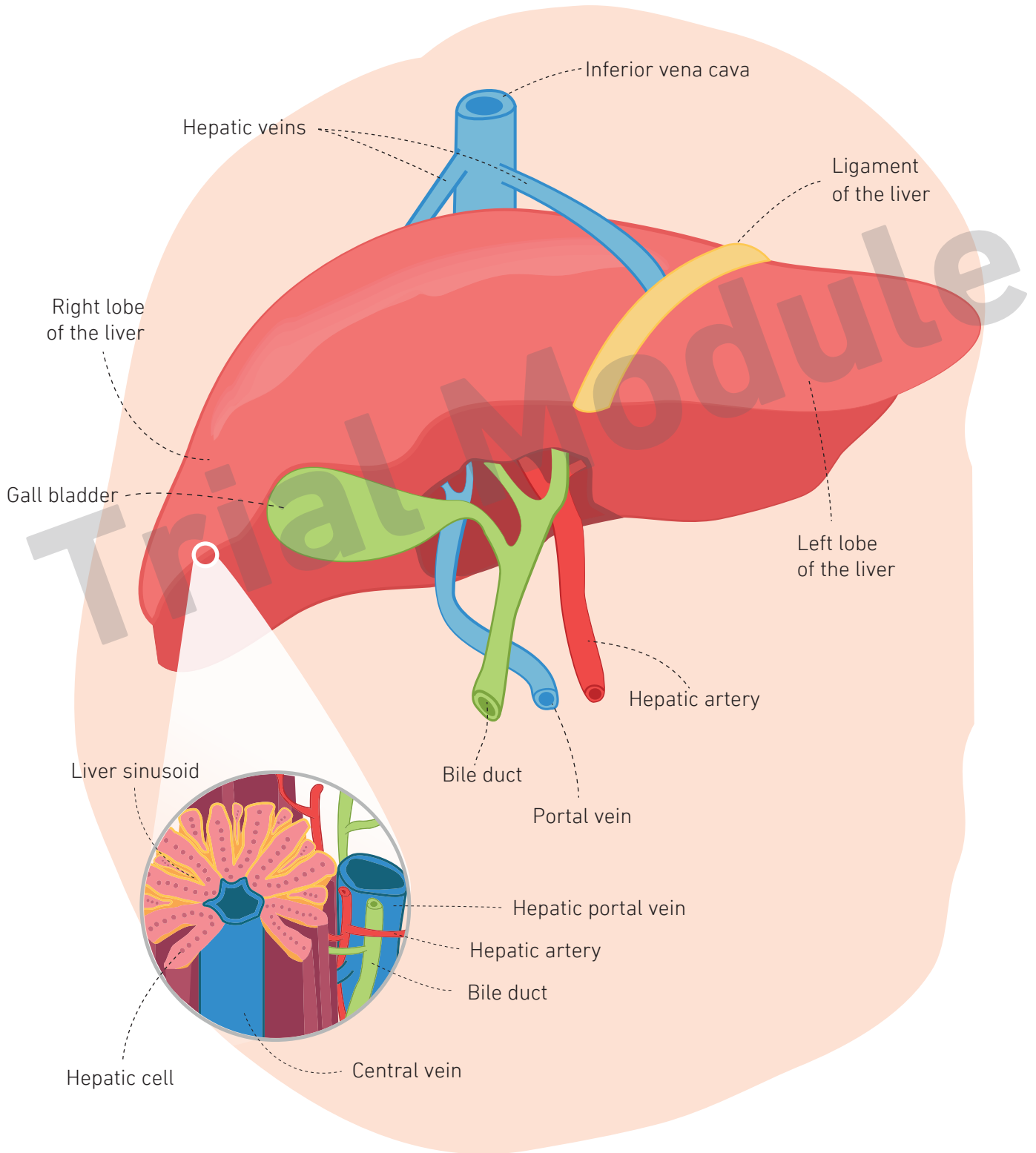
If needed, the bile is secreted to the colon, where the liquid emulsifies those fats that have been ingested previously by food and beverages. These fats can then be reabsorbed by the organism. (For more information see unit 5, "Gall Bladder")

## 1.2. Structure of the Liver

The liver consists of approximately 300 billion cells that combine to form a sponge-like tissue that is extraordinarily well supplied with blood. All in all, this organ weighs between 1.5 and 2 kg. The liver tissue is made up of an immeasurable number of so-called *liver lobes*. These tiny lobes (not to be confused with the right and left lobe of the liver) have a diameter of 1 to 2 mm and – with their hexagonal form – resemble honeycombs within a hive. The small liver lobes consist of the *sinusoids* and two different types of liver cells: the *hepatocytes* and the *Kupffer cells*.

The main part of the liver is made up of the hepatocytes. We will learn more about these cells in the following section (2. "Function of the Liver"). Throughout the liver tissue there run the sinusoids. These extended capillaries contain the blood coming from the portal vein and mix with the blood coming from the hepatic artery (see also section 1.4. "Liver Portal"). At the sinusoids' walls there are the Kupffer cells. These Kupffer cells are the liver's own phagocytes (scavenger cells); their task is to filter out all unnecessary substances from the blood that flows through the sinusoids. Thus, these cells clean the blood and devour over-aged blood cells.

# The Liver



**Your Direct Contact**

International Institute of Naturopathy

service@institute-of-naturopathy.com

www.institute-of-naturopathy.com

A Project of

**Swiss Education Center AG**

Galgenried 22

6370 Stans

Switzerland

Phone:

+41 41 552 29 90

Fax:

+41 41 552 29 99

