

Semestral work in Pathological physiology

(updated 2002, 2008, 2016, 2017)

1. The purpose of the work and presentation

Written preparation and oral presentation of the semester work is one of the prerequisites for the credit from the Pathophysiology in Medical faculty of P.J. Šafárik University in Kosice. The main purpose of these is to learn the students how to prepare the scientific paper as much as similar as in scientific journals and books and to present the results orally similarly as in symposia and congresses.

The written part - semestral work from Pathophysiology, by the style of writing and the content belongs to so called **minireviews (brief reviews)**, i.e. papers communicating the concise overview on a given subject summarizing up-to date knowledge. These popular papers, also called as **Current perspectives, Hot topics** etc., could be found in many scientific journals. These are short versions of the more concise regular Reviews. Preparation of the full review requires very good database of the recent achievements in a given topic, very good general knowledge on a subject based on the continuous study of previous results by others and of own, ability to extract the important results, organize them into logical structure and to draw summarizing conclusions and further perspectives. Unsurprisingly, **most reviews are invited** and based on the offer from publisher to experts with respected position and credibility in the field.

2. Choosing the topic for the work

The topic for the semester work is based on the **student choice**. However, it is advisable to consult the content and focus of future review with a teacher. The definitive title of the work has to be announced at least 3 weeks before the submission date. If necessary, students may apply for the as hoc topics proposed by teacher and apply for consultation about the contents or focus of the work during the practical lessons or consultation hours.

3. Content of the work

A. Introduction is an obligatory part of the semester work. It has to be prepared on the separate page and should not exceed one page. Introduction contains brief description of the current stage of the knowledge in the particular area and indicate the purpose, novelty or particular focus of the author's review. Further, it may provide the short historical overview and the achievements in the field up to date. It may also strengthen the importance of a chosen topic in the broader medical standpoint, e.g. impact on the public health, epidemiology, incidence and prevalence of disease, interesting medical research, etc.

B. Conclusions is an obligatory part of the work, which summarizes the main findings presented in the work. It may further evaluate the importance of these finding for the present understanding of pathogenesis or future perspectives on the subject. Conclusions are on the separate page and should not exceed one page of the text. Persons who assisted in the preparation of the work, or provided valuable advices, or reviewed the manuscript should be mentioned in the end of the Conclusion in the separate paragraph.

C. The body text of the project. The main part of the semester work is the body text of the expert review. The text has to be logical, synoptical and optimally divided into several chapters. Description should start from general considerations and should be followed by detailed data describing the mechanism. Description of mechanism should begin with overview of the systemic processes and signs and should proceed by cellular or molecular events. **Considerations about physiological and pathophysiological mechanism and principles – i.e. etiology and pathogenesis has to be an obligatory part of the work.** This makes clear distinction from the similar semester projects works prepared in morphological or clinical subjects.

D. Literature is a special chapter of the work providing the numbered list of references which are cited in the text (details read further).

E. Figures and Tables is a chapter of the work providing the list of figures and table and pages where they are (embedded in text) or cumulated figures and tables with their full description if not used in text.

Department of Pathophysiology Medical faculty P.J.Šafárik University Košice	
Title of the work	
Semester work	
Figure for illustration may be included	
Study year	Author' name Study group

Fig.1

using of bullets, intends, letters, numbers for further segmenting the text:

- xxxxxxxxxxxxxxxxxxxx
 - xxxxxxxxxxxxxxxxxxxx
- a) xxxxxxxxxxxxxxxxxxxx
b) xxxxxxxxxxxxxxxxxxxx

4.5. Formatting the tables and figures

Supplementary graphic objects - Tables (for data tables) and Figures (for pictures, graphs, photos) (abbreviated as **Tab.** and **Fig.**) - are used to clarify, illustrate and explain the text data (Note: do not use other descriptors as graph, picture, photo etc.). Description of the table or figure is always put **bellow the object**, it is published in **smaller font that the body text of the work** and contains following **components**: *Abbreviation and number*, *Title (in bold)*, *Description* (text explaining what is shown, what legend is used), *Abbreviations and symbols* (meaning of the symbols, arrows, abbreviations, etc.), *Citation of the resource*. Tables and figures (each separately) are **numbered in the order they appear in the work** (e.g., Fig.1., or Tab. 1.).

As to the citation of resources, the figures or tables can refer to the resources given in Literature or other typically on – line internet resources. In this later case the web page address has to be cited. Citation can be introduced by words denoting how much the resource was hard-copied, adapted, modified, combined etc.

It is strictly prohibited to use and even-more to hard-copy the title and description of pictures and tables from the resource works.

Tables and/or figures can be presented in two different ways:

a) **Embedded in within the text** (similar to the handbooks) close to the paragraphs which they refer to. This requires skilled work with the text editor but appears more attractive for reader. It is used by more and more students. In this case the chapter **Figures and tables** contains only the **list of the tables and pictures** with their titles and page.

b) **Added in the end of the work** in the chapter **Figures and tables**. In this case pictures and tables with full descriptions are given in the chapter **Figures and tables** in the end of the work.

Examples on how to quote the source:

Tab. 1. Cytokines in inflammatory response. Cytokines IL2 and IL6 (upper left part) play important role in the systemic manifestations of the (Adapted from Gear et al., 2001)

.....
Fig. 4. The principal inflammatory pathways. Summary scheme of the main inflammatory pathways (Combined from Prabhakar, 2007 and Bertly et al., 2009).

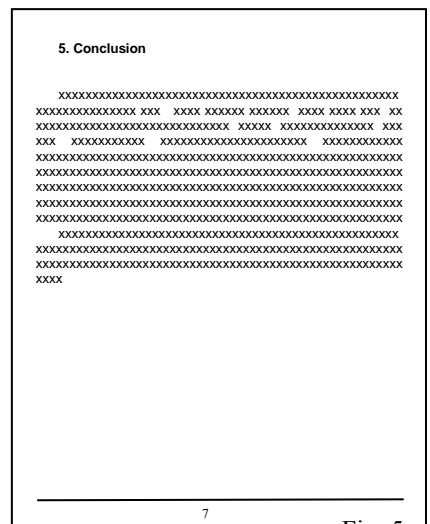
....
Fig. 6. Variable pathways of the inflammatory action of IL-1 (Based on the data from several resources. For details see the text).

.....
Fig.7. Cholesterol level in patients with STEMI infarction. (According to <http://www.hrzt-mirta.edu/5123-WS/opening.html>)

4.6. Citation of the references in the text.

In general there are 2 ways how to quote the references in the body text. Either to give the names of the authors with the year of the publication or to use the numbers according to the order in the list of references. To propel the scientific writing abilities, in semestral work **full name quotation in the text is required**. Below is shown how to cite single author, 2 authors (using &) or 3 and more authors (first + et al.).

- a) *at the beginning of the sentence or inside*: **Laron (1925)** was first who described (in case of 1 author) or: **Bloom & Pfeng (1987)** showed that (in case of 2 co-authors) or: **Darian et al. (1999)** observed similar effects (3 and more co-authors).
- b) *inside or at the end of the sentence* author's names and year of publication is given in brackets E.g. There are authors that suggest role of irisin in the metabolism of fatty acids (**Garcés et al., 2014**), as irisin is produced in fat tissue (**Lowe & Hegglin, 1996**).
- d) *Nesting*. If we want to put cumulatively several works in the end of



paragraph we organize citations according to the *year of publication*, not in alphabetical order, e.g. (Feneck et al., 1976; Ackerson & Bruce, 1986; Wang, 1993; Fung et al., 1997; Amish, 2016).

4.7 Conclusion is written on the separate page similar to Introduction (Fig.5) and summarizes main outcomes from the study.

4.8. Literature

The list of review's references not only shows the author's data selection but provides to a reader valuable additional resource to read. That means, bibliographic information should contain enough data for a reader to get to the original resource. In the scientific practice, putting the particular work into the list of references is a matter of reliance or confidence That is why science citation index (SCI) is a marker of quality of scientific data. (Fig. 6)

In Literature, **numbered list of references** have to be arranged in **alphabetical order** according to the **first letter of the surname** of the first author (from A to Z). If the first letter is the same, second is used and so on. If the whole surname is the same, first name abbreviations are considered (e.g. Barnes, A.F. precedes Barnes, P.J.). If the first author is identical, same principle applies for second author, etc.. Given there are several works from identical author and/or authors, these are arranged according to date of publication (older first).

4.8.1. Printed references or works on electronic carriers (CD, DVD)

a) Article in the printed journal (work in extenso, short communication, review, minireview, case study etc.) is the most widely accepted form of resource in medical science. Bibliographic reference contains: *name(s), title of the work, international abbreviation of the journal, volume (number), year, pages*. **Notes:** International abbreviations of the scientific journals are available in the Department of Pathophysiology. On the net the closest way of citing is in PubMed.

Example:

Bendat, J.K., Priesol., E.J., Zippel, P.: Pentobarbital causes respiratory depression by interacting with GABA-ergic system in upper brainstem. *Am. J. Physiol.*, 153 (2), 1987, p. 1120-1230.

In the text this reference is quoted as: Bendat et al. (1987) described or in the end of the sentence (Bendat et al., 1987).

b) Handbooks, monographs, university scripts, proceedings, year-books, almanacs, collections. Physically the resources are printed books, CD, DVD, ebook format. Bibliographic reference contains: *authors, title of the book, publishing house, headquarter, publication year, total number of the pages, ISBN*. Note: eBooks have obviously different ISBN from printed books. In collections or proceedings

Examples:

Novotná, B., Novák, J.: Alergie a astma v těhotenství, prevence v dětství. Grada Publishing, Praha, 2012, 244 p. ISBN 978-80-247-4390-5

McCance, K.L., Huether, S.E.: Pathophysiology, The Biologic Basis for Disease in Adults and Children, 7th ed., Mosby, St. Louis, 1840 p., ISBN 9780323088541 (eBook ISBN 9780323172059)

Rubin, R.E.: Foundations of Library and Information Science. New York, Neal-Schumann Publishers, 1998. 495 p., ISBN 0-02-852321-7

c) Text-books, collections, year-books, proceedings, almanacs. Physically the resources are printed books, ebooks CDs, DVDs, etc. Bibliography is same as previous. Authors are denoted as editors, who collected and organized the orders of works or chapters.

Examples:

Ráčz, O. (Ed): Základy patologickej fyziológie. Amicus, Košice, 2006, 243 p. ISBN 80-909477-7-X

Beňáčka, R. (Ed.): Patofyziológia 2010. Collection of scientific works from 18. Conference of Slovak and Czech Pathophysiologists. 9.-10. 9. 2010, Košice, 103 p., ISBN 978-80-7097-827-8 [CD-Rom]

6. Literature

1. Abington, F.D., Tucevaya, P.M., Gordon, P., Methas, L., Yefray, N., Almog, I.S., Boors, G.:
2. Abington, F.D., Wang, P.L., Gordon, P., Almog, I.S: Involvement of potassium transients in microcilary transportation in opossum epithelia in vitro. *Am.Physiol. J.*, 123(2),
3. Bardon, E.S.: Positron emission tomography of microfractures of upper extremity. *J. Traumatol.*,
4. Barnes, A.F.: Cough in children with asthma. Raven press, New York, 2004, 238 p.
5. Barnes, P.J. Reactivity of upper airways in infants with allergic rhinitis and asthma. Survey study. *Respiration*, 23 (5), 1996, p.25-36.
6. Barnes, P.J.: Kinases as Novel Therapeutic Targets in Asthma and Chronic Obstructive Pulmonary Disease. *Pharmacol. Rev.*, 68(3), 2016, p.788-815.
7. Barnes, P.J., Amers, J.S.: Changes in the airways reactivity and cough intensity in preterm neonates during early infancy. *Neonatology*, 12(6), 2002, p. 12-31
8. Contou D, Dorison M, Rosman J, Schlemmer F, Gibelin A, Foulet F, Botterel F, Carreaux G, Razazi K, Brun-Buisson C, Mekontso Dessap A, de Prost N.: Aspergillus-positive lower respiratory tract samples in patients with the acute respiratory distress syndrome: a 10-year retrospective study. *Ann Intensive Care*. 2016, 6(1): 52. doi: 10.1186/s13613-016-0156-2.

d) Chapter in book, handbook, monograph, year-books, collections. (Bibliographic reference contains: names, the title of the work, title of the book, editors (Ed.), publishing house, headquarter, year, pages), ISBN (i.e. international code of the book) Example:

Mayer, B.K., Norberg, I.J.G.: Brain dysfunction in cerebral hypoxia and ischaemia. In: *Brain dysfunction in metabolic disorders*, (Ed.) Plum, F., Mc Kayne, J.S., Raven Press, New York, 1984, p. 86-108, ISBN 826-234-125-80

In the text this work is quoted as follows: In the beginning of sentence, e.g.: Mayer and Norberg (1984) found that ... or in the end of paragraph in brackets (Mayer & Norberg, 1984)

e) References to norms, statistical data, guidelines. Issued by institutions with no specific authors:

OECD: Guidelines for testing of chemicals. Paris, OCED, 1981. 123 p. ISBN 126-234-18-108x

In the text the resource is quoted similar to previous: These norms were first published in OCED (1981).

4.8.2. Resources from internet

Internet contains a myriad of various laic or expert articles, views, comments, data, figures, schemes, commercial info including e-versions of scientific journals, university pages, etc. Acceptable are **authorized articles** (i.e. authors must be clearly denoted) from **credible resources** (expert or scientific articles, reviews in electronic journals, books, portals, conferences, etc.).

a) Text documents in on-line version of printed journals (articles) or books (chapters) available for viewing (*.html) and/or download (*.pdf) are reported in Literature similarly as printed ones (above) inasmuch they contain necessary bibliographic data (e.g. range of pages, year of publication, publisher).

b) Text documents in on-line journals or books (chapters). To quote electronic online resources we can use unique identification by DOI (e.g. if you get pdf outprint) or we put the web page.

Example:

Aguirre- Bermeo, H., Morán, I., Bottiroli, M. Plazolles, E.: End- inspiratory pause prolongation in acute respiratory distress syndrome patients: effects on gas exchange and mechanics. *Ann. Intensive Care*, 6: 81, 2016, DOI 10.1186/s136130-160-183-z

alternatively

Aguirre- Bermeo, H., Morán, I., Bottiroli, M. Plazolles, E.: End- inspiratory pause prolongation in acute respiratory distress syndrome patients: effects on gas exchange and mechanics. *Ann. Intensive Care*, 6: 81, 2016, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4996808/> [online 2016-09-20]

Granth, E.: Challenges, Strategies, and Tools for Research Scientists. *Electronic Journal of Academic and Special Librarianship*, 2002, 3(3), http://icaap.org/Granth_d01.htm [online 2003-01-10].

Gordin, F.G.: Role of interleukin-8 in neutrophil chemotaxis. *Journal of Americal Society of Advancement in Medicine*. 2012, 2 (1), <https://www.nsd.com/jitccd/inter.htm> [online 2012-04-23]

c) Other online resources (atlases, proceeding, abstract books, electronic posters, lectures or databases without printed version)

Example:

Kjehdal, I.J.: Blood viscosity. In: Kimbal's biology on-line. <https://www.kimbals.biol.org/blood/5646.htm> [online 2002-09-30]

Madhur, M.S., Riaz, K., Harrison, D.G.: Hypertension. . <http://emedicine.medscape.com/article/241381-overview> [online 2016-09-21]

d) web pages of universities, departments, web portals of the societies, and similar

Example:

Werner, J.K.: Sleep apnoea in cardiac patients. <https://www.sleep.org/home.htm> [online 2012-11-22]

Contents

1. Introduction	1
2. Pregnancy	2
2.1. Normal pregnancy	3
2.2. Pathological conditions	3
3. Adipokine studies	4
3.1. Leptin	4
3.2. Other adipokines	5
3.2.1. <i>Irisin</i>	5
.....	
.....	
6. Conclusions	10
7. Literature	11
8. Figures and tables	13

3. Adipokine studies

The results of the study carried out for thousands of pregnant women aged 17-48 years showed that the first measurement conducted up until the fourteenth week of pregnancy and examinations in the last trimester (after the twenty-eighth week) showed an increase of total lipids, cholesterol, LDL and VLDL particles. Said state is partly the result of oestrogen action, which increases liver excretion of VLDL particles and also inhibits the activity of hepatic lipase, tissue lipase activity is decreased as well. Increased level of HDL is supposed to be a protective factor against the effects of VLDL and LDL particles (Emet et al., 2013). Discrepancies in these, e. g. increase in VLDL and HDL decline it is associated with pregnancy complications, which include pre-eclampsia (Charlton et al., 2014).

3.1. Leptin

In order to clarify the regulation of lipids during pregnancy with a goal to describe the correlation between values in the pathological conditions, research of AFABP and three adipocytokines, leptin, adiponectin and RBP4, which have a role in regulating lipid metabolism, was presented. Herrera & Ortega-Senovilla (2014) described elevations in plasma AFABP mothers with GDM compared to normal group, which may be related to dyslipidemia connected with GDM.

Leptin is produced by adipose tissue, the production may be performed also by other tissues, placenta among other tissues, therefore, the plasma concentration during pregnancy progressively increases to its maximum in the third trimester. Its main effect is lipolysis in adipose tissue and to decrease insulin sensitivity of maternal tissues in order to provide nutrients to a fetus. RBP4 transports retinol from the liver to the target tissues, but also regulates the metabolism of glucose, reducing the maternal insulin sensitivity. Its concentration increases with the progression of pregnancy, stronger elevated levels were measured at GDM. On the contrary, adiponectin, which is mainly synthesized in the placenta and fetal tissues, results in increased sensitivity of maternal tissues to insulin, where low values are risk factor for the development of Type II diabetes mellitus, and the values were decreased in women with GDM compared to healthy pregnant.

3.2. Other adipokines

3.2.1. Irisin

Huh et al. (2012) and Bostrom et al. (2013) respectively, reported adipomyokine irisin that is produced by various structures, such as skeletal muscle, mainly in response to exercise. Irisin's task is to turn white fat to brown, helping to generate heat. There are authors that suggest, there is another function of irisin in the metabolism of fatty acids (Garcés et al., 2014), as irisin is produced by other structures, including the placenta through the precursor FNDC5 and then by a selection of an alternative codon.

7. Literature

1. **Abrams, L., Joonas, G. N.:** Adipokines in pregnancy and its metabolism – a meta-analysis. *J. Clin, Gynaecol. Obst.*, 110 (15), 2015, p. 228-245.
2. **Boström, P. A., Graham, E. L., Georgiadi, A. et al.:** Impact of exercise on muscle and nonmuscle organs. In *IUBMB Life*, 2013, 65 (10), p. 845-850.
3. **Charlton, F., Toother, J., Rye, K. A.:** Cardiovascular Risk, lipids and Pregnancy: Preeclampsia and the Risk of Later Life Cardiovascular Disease (Review). In *Heart, Lung and Circulation*, 2014, 23 (3), p. 203-212.
- ...
6. **Derenier, A., Klassen, H., Simons, U.:** Signal molecules produced by adipose tissue. In: *Metabolism*, (Ed.) Irving, M., Hans, L. M., Oxford Publishing, 2010, p. 25-42.
7. **Emet, T., Ustüner, I., Güven, S.G.:** Plasma lipids and lipoproteins during pregnancy and related pregnancy outcomes. In *Arch Gynecol Obstet*, 2013, 288 (1), p. 49-55.
8. **Garcés, M. F., Peralta, J. J., Ruiz-Linares, C. E.:** Irisin Levels During Pregnancy and Changes Associated With the Development of Preeclampsia, *J. Clin. Endocrinol. Metab.*, 2014, 99 (6), p. 2113-2219.
9. **Herrera, E., Ortega-Senovilla, H.:** Lipid metabolism During Pregnancy and its Implications for Fetal Growth. In *Curr. Pharm. Biotechnol.*, 2014, 15(1), p. 24-31.
10. **Hu, Y., Ling, M., Wang, H. et al.:** New perspectives of pregnancy metabolism. University Press, Cambridge, 1992, 565 p., ISBN 234-5677-201-234
11. **Huh, J. Y., Panagiotou, G., Mougios, V.:** FNDC5 and irisin in humans: I. Predictors of circulating concentrations in serum and plasma and II. mRNA expression and circulating concentrations in response to weight loss and exercise. In *Metabolism*, 2012, 61 (12), p. 1725-1738.
- ...
14. **NACOG:** Recommended values of various metabolites in specific parts of pregnancy. New York, NACOG, 2009, 65 p.
- ...
17. **Olafsson, J.:** Pregnancy changes in maternal and fetal organism. In: *Pregnancy online*. <https://www.pregnancy-online.com/metabolism/lipids.htm>
18. **Wargburg, K. P.:** Metabolical pathways in pregnant and non-pregnant women. <https://www.pregnancy.net>, 2008.