

# Newsletter

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<u>A M M A T I O N</u>

Spring 2017

http://europeanshocksociety.org/ https://www.facebook.com/europeanshock/

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## **Editorial from the ESS President**



The vitality of scholarly societies can be appreciated in different ways: by their total number of active members, their capacity to attract new and young members and/or their presence on the social networks. Furthermore, their vitality can be regularly re-assessed when the members meet at annual or biannual conferences. Do we wish to demonstrate that the European Shock Society remains an active and healthy society? To prove just that, we are going to gather motivated members who share the same spirit, the same thirst for knowledge, the

same will to share experience and expertise, the same desire to learn more, the same dedication to listen to each other. In brief, the strong participation of the members at our biennial conference is not only driven by an opportunity to share scientific data, news, ideas and goals. It is also provoked by the desire to maintain a unified community of scientists and medical doctors gathered by a common will: the translation of new understandings of biological processes during physical (trauma, hemorrhage) or infectious (sepsis) threats to the benefit of the patients.

Another important aim we all face is more general: to encourage our scientific and medical communities to strongly engage in the public, not always purely scientific discourse. The current environment of the public society (in the UE and beyond) in general is difficult to bear with and is frequently soaked with hostile sentiments. Populism has inflicted a severe damage in the Western world, and the scientific/medical community is no less affected by these trends. The recent election in the US serves as a sobering example. Namely, the country perceived as the ultimate science hub has been now led by a president who denies scientific truths and offers alternative facts instead (see one of his most astonishing tweets: "The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive."). Similarly, our colleagues from the UK will have to endure long-lasting effects of the "Brexit". Scientists and clinicians alike need to defend both the scientific truths as well as common sense; and while doing that, they need to be heard loud



and clear by the population. The "March for Science" of April 22nd, 2017 was a success worldwide but it was rather poorly reported by the mainstream media. The one I attended in Paris, gathered approx. 5000 people. Yet, it was not even mentioned by the French massmedia. Indeed, science was not even addressed by most of the eleven presidential candidates. Budget cuts for scientific research have been

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introduced in many countries and "begging for money" (i.e. spending a huge amount of our time writing grants) keeps us for most part silent and very busy. We should be also more involved in the life of our general (non-professional) societies. My current dream is that each scientist recognized with the Nobel Prize would courageously address the pressing scientific as well as societal issues. With the Nobel Prize in hand as the Holy Grail, there is not that much more to risk anymore if one gets involved in controversial/unpopular discourses. There are few noble examples to follow. Linus Pauling (1901-1994) is the only scientist who after receiving the Nobel Prize in his professional discipline (Chemistry, 1954), was subsequently honored with the Nobel Prize for Peace (1962) for his enduring commitment against nuclear tests. Peter Agre (born in 1949), a Nobel Prize in Chemistry (2003), as president of the American Association for the Advancement of Science, has been a key campaigner for scientific diplomacy and has supported normalization efforts between Cuba and USA.

On the more optimistic note, there is another great reason to gather at the incoming ESS Congress in Paris: to create new friendships, new solidarity networks, new complicities and to develop a good feeling of belonging to a strong and motivated group of nice and bright people. Thanks to the hard work of our international and national scientific councilors, we have compiled a terrific list of bright and gifted speakers (see the list in our previous Newsletter and the ESS conference website). The program itself is outstanding and focuses on the most up-to-date and hot topics. Accordingly, we, the ESS members (and ESS members *in spe*) have a unique opportunity to share great science, to have fun, to be in one of the most attractive and beautiful cities in the world, to gather and discover a historical place where Louis Pasteur used to live and work... Simply, to attend an amazing and memorable congress. The organizing committee together with the scientific council awaits and will be delighted to welcome you all in Paris this September.

We look forward to an exciting congress at Institut Pasteur with the hope you also will take the time to visit the museum (Louis Pasteur apartment and his tomb)



Jean-Marc Cavaillon

# Present status of the upcoming ESS Congress (2017)

September 13-15, 2017 http://www.essparis2017.org/

The XVII. Congress of The European Shock Society to be held in Paris, France (ESS; September 13-15, 2017) is coming closer.

The ESS Congress will be held in conjunction with the **11<sup>th</sup> Annual Symposium of the International Sepsis Forum** (SEPSIS 2017; September 11-13, 2017; http://internationalsepsisforum.com/sepsisconferences/).

JOIN US IN PARIS FOR THE JOINT ISF & ESS SYMPOSIA AT THE INSTITUT PASTEUR PARIS ISF SEPTEMBER 11-13 ESS SEPTEMBER 13-15



Abstract submission deadline: June 30, 2017

Please submit your abstracts online via the link to our congress website

http://www.essparis2017.org/#call-for-abstracts

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## Awards - ESS 2017 Congress

Don't forget to apply and/or encourage your team members and colleagues to **apply for the award competitions:** 

#### **POSTER AWARDS**

Three Poster Awards (first, second and third place certificates) will be given to top presentations. The Poster Award Committee will judge all posters during the Poster Sessions (13th and 14th, September 2017).

#### NEW INVESTIGATOR AWARD in EUROPEAN SHOCK RESEARCH

Out of all qualifying abstracts submitted by junior scientists (Every person, irrespective of age, with a maximum of 5 years of post-doc experience (or equivalent, e.g. intern/resident etc.)), five top submissions will be selected to the final **European New Investigator Award Competition (ENIAC)** round at the 2017 ESS Congress in Paris (September 13-15, 2017). All qualifying abstracts will be scored on merit in a blinded manner by five international expert judges (members of European Shock Society). The judges will be selected only after abstract submission process has been closed to avoid any conflict of interest. Five finalists will present their work in a ten-minute presentation followed by a short Q&A session with a panel of five judges on Thursday, September 14th, 2017. Only the top three places will be ranked according to the total score received. Winner will be recognized with a plaque and a cash award of €600. Second place will receive cash award of €400 and third place of €200. Only one abstract per applicant will be accepted. Applications received after the deadline will not be considered for awards.

#### **GÜNTHER SCHLAG AWARD**

This award is funded by the Ludwig Boltzmann Institute for Experimental and Critical Traumatology (LBI) in Vienna, Austria in commemoration of the institute's founder and its first director, Dr. Günther Schlag. The Award (500 € cash and certificate) is given to an outstanding European junior to mid-level researcher (no higher than Assistant Professor rank) in the field of critical care and shock research. The selection is made by the LBI executive committee based on the merit of the submitted abstract and the candidate's overall professional development. No separate application is required.

#### **TRAVEL AWARDS**

To facilitate high participation of young/new scientists, a total of 10 travel grants of €500 will be provided by the European Shock Society to junior investigators (Every person, irrespective of age, with a maximum of 5 years of post-doc experience (or equivalent, e.g. intern/resident etc.)) based on scientific merit of the submitted abstract. Only one abstract per applicant will be accepted.

For application instructions, please see <a href="http://www.essparis2017.org/#award-competitions">http://www.essparis2017.org/#award-competitions</a>

# Program - ESS 2017 Congress

Please take a look at the exciting program with numerous "premières" <a href="http://www.essparis2017.org/#scientific-program">http://www.essparis2017.org/#scientific-program</a>



#### FIRST SUMMER SCHOOL ON SEPSIS during the World Sepsis Day

(Speakers: Markus Huber-Lang, GER, Marcin Osuchowski, AUT, Jean-Marc Cavaillon, FRA, Tom van der Poll, NL, Irshad Chaudry USA, Chris Thiemermann, UK)



#### FOR THE FIRST TIME, A SESSION SHARED WITH THE US SHOCK SOCIETY on New tracks for new therapies

(Speakers: Chris Thiemermann, UK, Timothy Biliar, USA, Claudio Ronco, ITA, Pierre-François Laterre, BEL, Paul Wischmeyer, USA, Ping Wang, USA)



#### FOR THE FIRST TIME, A SESSION SHARED WITH THE CHINESE SHOCK SOCIETY on Pathophysiology of sepsis and MODS

(Speakers: Yong-ming Yao, CHN, Claude Libert, BEL, Xiang-ming Fang, CHN, Xian-zhong Xiao, CHN, Soheyl Bahrami, AUT)

#### ..... And 13 other sessions on:

• Good or bad gases • Hemorrhagic shock • Non-bacterial sepsis • Biomarkers of infection • Resolution of inflammation • Antibiotics and anti-microbial strategies • Consequences of shock and sepsis on brain • Animal models for human shock and sepsis • Long term consequences of trauma and sepsis • Metabolic changes during sepsis/critical illness • Immune dysregulation during sepsis and shock • Revisiting sepsis definitions: impact and consequences • Role of comorbidities in the danger responses to shock

#### A session in partnership with WAAAR

(World Alliance Against Antibiotic Resistance)

World Alliance Against Antibiotic Resistance

A session in partnership with SFAR (Société Française d'Anesthésie et de Réanimation)



Please visit our website to get more information on the congress: http://www.essparis2017.org/ Please also encourage your team members and colleagues to attend the meeting.

Jean-Marc Cavaillon



## I would love to be a tourist in Paris!

(Part 3 / 3)

[...] After this long walk in Paris, along the river Seine or up to Montmartre, it's time to visit some of the 136 Paris museums. The "must-sees" are of course Le Louvre and Le Musée d'Orsay. Le Louvre (closed on Tuesday) opened its doors as the first European art museum in 1793. Between 1983-1998 it was greatly transformed. The conversion work was entrusted to the Chinese born, US architect leoh-Ming Peï who created the remarkable glass pyramid, now housing the entranceway. Quite controversial when proposed, now applauded, this glass pyramid with its 673 diamond-shaped panes is a symbol of the XXth century added to this historical building founded in the XIIth century. Have a look at it also during the night. It is such a huge museum that it is advisable to choose in advance the rooms/exhibitions matching your taste and artistic preferences. However, don't miss to see the foundations of the first royal fortress (early XIIIth century) discovered during the recent renovation works. Have a look at the Egyptian antiquities brought back by Champollion who deciphered hieroglyph in 1822. Shake the hand of the Venus de Milo (I am teasing you) and ponder the enigmatic smile of Mona Lisa by Leonardo da Vinci. The collection of Islamic art, oriental antiquities, French sculptures and Europeans paintings are worth to be seen. Le Musée d'Orsay (closed on Monday) is housed in a former railway station, the first in 1900 to benefit from electricity. The presentation of paintings and sculptures of the second half of the XIXth century is absolutely gorgeous. There are the most famous paintings of the Impressionists (Manet, Monet, Renoir, Cézanne, Pissaro, Mary Cassat, Degat...) as well as pre- (Ingres, Delacroix, Daumier, Millet...) and post (Van Gogh, Seurat, Toulouse-Lautrec, Gauguin...) periods. A recent acquisition, "La création du Monde" by Gustave Courbet, a quite provocative painting, hidden for years is now shown to the public. As I mentioned, there are so many museums that you could spend one day in each of them during four months. Unfortunately, work will call you back. You will be in



a hurry to perform new experiments after having listened to our colleagues. However, I would like to suggest, before you leave, to visit few other museums. The **Musée Marmottan**, located in a previous hunting lodge: your visit to the Impressionists would not have been complete without having seen the painting "Impression, soleil levant" (*Impression at sunrise*) the famous Claude Monet's painting which gave its name to the Impressionist movement (see picture above). There, are also

the personal collection of the painter and some other prestigious collections and donations. In the quarter Le Marais, take a chance to see La place des Vosges and visit two nice mansions

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which house the **Musée Carnavalet**, an interesting museum devoted to the history of Paris (see the Bastille, the famous prison freed on the 14th of July 1789, or more exactly a replica made in one stone of the jail) and the **Musée Picasso** which gather 251 paintings

representative of all the artist career. There are also 160 sculptures such as this famous bull head made with a saddle and handlebars. Among other museums devoted to one artist, there is the "**Espace Dali**" at Montmartre, where great paintings and sculptures of the artist are presented. I would also recommend you to visit the **Musée Rodin**, where prestigious and magnificent sculptures of the master can be seen. Look also to the wonderful and delicate sculptures of Camille Claudel, his bright lover for a while. From the garden, don't forget to take a picture of the gold dome of **the Invalides**, shining at sunset. If you like



tapestries, enjoy the famous medieval "Dame à la Licorne" in the **Musée National du Moyen Age / Thermes de Cluny,** in the Latin quarter where you could also admire some remains of 3rd century Gaelic-Roman baths. Finally if you want to have fun, visit the **Musée Grévin**, the wax museum and meet Hitchcock, Mozart, Michael Jackson, Charlie Chaplin, Marylin Monroe, Lara Croft and some famous figures of the French history. All afternoon, there are fantasy shows. A tour at the **Fondation Louis Vuiton** (see picture below) would be also worthwhile.



But if you want to have a memorable live show, spend an evening in one of the cabaret, the Crazy Horse Saloon, the Lido, the Folies Bergères, or the Moulin Rouge, and watch the most beautiful girls in the world and enjoy the French Cancan dance. Of course, for those who love classic, one night at the Opera (without any phantom) is also possible (Opéra Garnier or Opéra Bastille). Book ahead of time...



Remember that Paris has a very efficient subway system, which will allow you to easily reach all these different places to enjoy in Paris *intra muros*. Not far from Paris, you should not miss Versailles (the palace, the gardens, the Trianons, the hameau) and if you will be accompanied with kids, they will most certainly prefer to spend a day at Disneyland<sup>®</sup> Paris! Well in any cases there will be for everyone's taste. Enjoy the visit... and the Conference!



Jean-Marc Cavaillon

# **Congress Reports**

# Report from the Wiggers-Bernard conference (Vienna, May 4-5, 2017)

With support of AUVA and Lorenz-Böhler Hospital, the Ludwig Boltzmann Institute (i.e. Marcin Osuchowski with the help of H. Redl and S. Bahrami) organized the 9<sup>th</sup> Wiggers-Bernard Conference entitled: *"Pre-clinical Modeling in Sepsis: exchanging opinions and forming recommendations"*. The timing of this meeting was perfect; there is a growing need for standardization/adjustment in the field of sepsis pre-clinical modeling, especially in the context of the recently updated definitions for human sepsis (Sepsis-3).



Gala dinner at the Art History Museum, Vienna,

The meeting gathered more than 30 experts from 15 different countries centered around six pre-defined working groups including: 1) infection types, 2) study design, 3) organ injury & dysfunction, 4) critical fluid resuscitation, 5) antibiotic and adjunctive therapy and 6) human modeling endpoints. The key aim of the conference was to launch an orchestrated effort towards creating the so called *"Minimum Quality Threshold in Pre-clinical Sepsis Studies"* (*MQTiPSS*). The conference was preceded by a significant preparatory workload shared by all participants in order to maximize its outcome. The symposium has been very successful in achieving its objective; the first set of *MQTiPSS* recommendations has been formed. In the next steps, these recommendations will be translated into an expert-opinion publication to be disseminated in the research community. The results of the this conference will be presented in a number of the upcoming sepsis-related meeting such as 2<sup>nd</sup> Polish Congress Surviving Sepsis (Wroclaw, Poland) 40<sup>th</sup> Annual Conference on Shock (Ft. Lauderdale, FL, USA) and 17<sup>th</sup> Congress of European Shock Society (Paris, France).

## **Historical perspective**



During the eighteenth and nineteenth centuries, one of the major occurrence of sepsis was puerperal fever. Doctors who apprehended this affection, recognized their disarray, their powerlessness, and the poor efficiency of the oftenrecommended practice of bloodletting. In a report published in French in 1783 and translated in English (left picture) it was said: "The ravages it causes so frequently present the most distressing picture for humanity. Is it a more heartbreaking performance! Is there a

more sad position for the doctor than to see every day perishing, in spite of his most ardent and most eager care, a certain number of women in bed, without ever the consolation of having saved one? Denis Claude Doulcet (1722-1782) practiced at the Hôtel Dieu, Paris where numerous epidemic episodes occurred regularly since 1664. He believed that the management of the disease as an inflammatory condition using bleeding and refreshing drinks had wasted precious time. Instead, he indicated the need to administer, at the first onset of symptoms, 15 grains of ipecacuanha (a Latin American plant that acts as an emetic) in two doses at an interval of one and a half hours. An oily potion consisting of two ounces of sweet almond oil, one ounce of marshmallow syrup and two grains of mineral kermes was then administered. The treatment was renewed the next day and if necessary during the following days. It is stated that as such treated, two hundred women have been resuscitated to life. Amazing and fascinating results, aren't they? Too bad placebo controled and double blind investigations were not carried out at that time!

These observations were reported on 6 September 1782 before the French Royal Society of Medicine by eight confreres of Dr. Doulcet who died on 22 May of that same year. In a subsequent text signed by Felix Vicq d'Azyr (1748-1794), perpetual secretary of the society, it is mentioned that this very dangerous, very lively, very murderous disease was often epidemic and sometimes contagious. These texts were brought to the attention of English clinicians thanks to a translation made by John Whitehead (1740-1804) who seems to have positioned his own personal view making a parallelism with putrid fevers.

Jean-Marc Cavaillon

# **Please visit us on Facebook**

#### https://www.facebook.com/europeanshock/



## Welcome new ESS members



Herbert Spapen, MD, PhD Belgium

Nurila Maltabarova, MD, PhD Republic of Kazakhstan

# Journal Club: What is new in shock research?

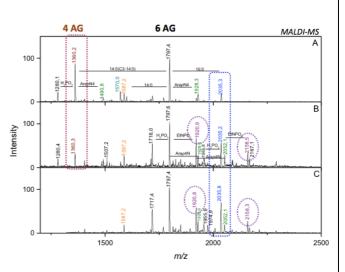
## Highlights of remarkable findings recently published in shock research

LPS: more than a very heterogenous product

**Source:** Novikov A, Breton A, Caroff M. Micromethods for Isolation and Structural Characterization of Lipid A, and Polysaccharide Regions of Bacterial Lipopolysaccharides. Methods Mol Biol. 2017;1600:167-186.

#### Main important messages:

It was already known that endotoxin, (lipopolysaccharide, LPS) preparations contain a highly heterogenous product since smooth LPS preparations contain a mixture of rough, semi-rough and smooth LPS. In this paper, the authors reveal that the same commercial product (*Salmonella Minnesota* Re 595 LPS) acquired from a company, but corresponding to three different batches were chemically different as seen by the matrix-assisted laser desorption/ionization (MALDI) mass spectrum (MS) analysis (see picture). This illustrates why sometimes



experiments are difficult to reproduce, and how studies on structure-activity relationship might be biased...

Written by: Jean-Marc Cavaillon, Institut Pasteur Paris

Platelets, thrombocytopenia, sepsis host response

**Source:** Claushuis TA, van Vught LA, Scicluna BP, Wiewel MA, Klein Klouwenberg PM, Hoogendijk AJ, Ong DS, Cremer OL, Horn J, Franitza M, Toliat MR, Nürnberg P, Zwinderman AH, Bonten MJ, Schultz MJ, van der Poll T; Molecular Diagnosis and Risk Stratification of Sepsis Consortium: **Thrombocytopenia is associated with a dysregulated host response in critically ill sepsis patients**. Blood. 2016;127(24):3062-72)

#### Main important messages:

- $\rightarrow$  The role of platelets in the host response to sepsis in humans has not been extensively studied so far. Thrombocytopenia occurred in approx. 40% of 931 sepsis patients enrolled into the study in 2 academic Dutch ICU's.
- → Patients with low platelet count (<100x10<sup>9</sup>/L) were more severely ill (higher APACHE IV and SOFA scores) and more frequently developed shock and organ failure than non-thrombocytopenic ones. Thrombocytopenic patients had substantially increased mortality up to one year after ICU admission. This finding was also confirmed in the multivariable Cox

regression analysis in which low platelets count were significantly associated with 30-days mortality.

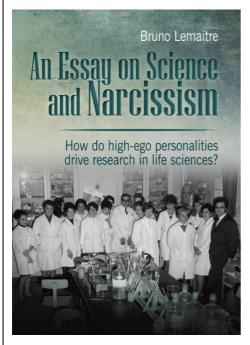
→ Thrombocytopenia was associated with increased systemic cytokine levels (IL-9 and IL-10) and activation of vascular endothelium assessed as angiopoetin-2 to angiopoetin-1 ratio. The whole genome expression array of blood leukocytes revealed significantly increased expression of genes related with complement signaling while genes related with leukocytes adhesion, extravasation and diapedesis were downregulated.

Although numerous preclinical studies showed broad activities of platelets in the systemic inflammation and sepsis, this paper reports the first prospective well-powered study investigating role of platelets in the host response during human sepsis. It confirms the association of thrombocytopenia with mortality and severe course of sepsis. Even though this study does not provide mechanistic link between platelets counts and the cytokine production or endothelium dysfunction, these observations in human patients confirm data from experimental models which demonstrated the important role of platelets in inhibition of cytokine production and their protective effects on the vascular endothelium.

Written by: Tomasz Skirecki, Center of Postgraduate Medical Education, Warsaw

#### A book of interest to read

**Source:** Bruno Lemaître: An assay on science and narcissism (http://brunolemaitre.ch/narcissism-science/book/)



Written by Bruno Lemaître (the discoverer of the antiinfectious role of the Toll molecule in drosophila, which ended to the Nobel prize awarded to Jules Hoffmann) has written an interesting essay on the influence of narcissism in conducting science (book available on the WEB : http://brunolemaitre.ch/narcissism-science/book/).

Examples are given such as Sigmund Freud, Niels Jerne, Jacques Monod and many others. While the "me me" generation, the use of facebook and selfies are becoming so popular in our societies, it is of interest to question ourselves, knowing what occurred in the past, how narcissism will continue to influence research.

Written by: Jean-Marc Cavaillon, Institut Pasteur Paris

# **Meeting updates**

#### 40<sup>th</sup> Annual Conference on Shock

Mariott Harbor Beach June 3-6, 2017 Fort Lauderdale, Florida <u>http://shocksociety.org/Meetings/Annual-Meeting-Schedule.aspx</u>



40th Annual Conference on Shock Marriott Harbor Beach Fort Lauderdale, Florida June 3 - 6, 2017



#### **30<sup>th</sup> Annual European Congress on Surgical Infections**

Hamburg, Germany June 8-9, 2017 <u>http://sis-e.org/2017/</u>



### 8<sup>th</sup> World Congress of the Abdominal Compartment Society WSACS

June 15-17, 2017 Banff, Alberta, Canada http://www.wcacs2017.org/

**2017 RDCR SYMPOSIUM** June 26-28, 2017

Bergen, Norway <a href="http://rdcr.org/">http://rdcr.org/</a>



#### 17th Congress of European Shock Society: numerous "premières"

September 13-15, 2017 Paris, France <u>http://www.essparis2017.org</u> Travel grants offered by Tebu-Bio: <u>http://www.tebu-bio.com/readMoreOffre/580/get-your-400-</u> <u>euro-travel-grant-.html</u>



**30th ESICM Annual Congress Vienna** 



September 23-27, 2017 Vienna, Austria

18<sup>th</sup> Congress of the European Society for Organ Transplantation September 24-27, 2017 Barcelona, Spain



http://esot2017.esot.org/

13<sup>th</sup> World Congress of Intensive and Critical Care Medicine/XXII Brazilian Congress of Intensive Care Medicine November 8-11, 2017 Rio de Janeiro, Brazil

http://www.criticalcare2017.com.br/ingles/





#### <u>41<sup>st</sup> Annual Conference on Shock</u> June 9-12, 2018

JW Marriott Camelback Inn Resort and Spa Scottsdale, Arizona

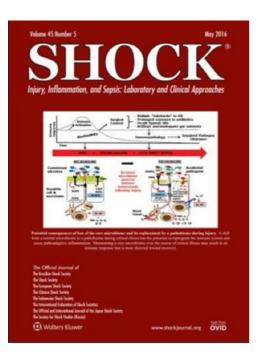
http://shocksociety.org/Meetings/Future-Meetings.aspx

# Call for volunteers to join the ESS council

We are looking for responsible, dependable, active members of the ESS to join the ESS council. Being a member of the ESS council is an excellent opportunity for active engagement in a highly dedicated team of physicians and scientists. Please support us in planning, coordinating and carrying out the diverse activities of the ESS and play an active part in promoting our society.

If you are interested in volunteering or need more information on the rights and responsibilities of a council member, please send an e-mail to Jean-Marc Cavaillon, President of the ESS (mail to: mailto:jean-marc.cavaillon@pasteur.fr)

## Invitation to publish in Shock®



Shock is a monthly journal that publishes the results of investigations in the field of injury, inflammation and sepsis; of clinical and laboratory origin alike (current IF=3.05). It is the official Journal of all international Shock Societies, including ESS. Thanks to its efficient reviewing process, you will typically have your submitted paper reviewed within 15 days.

So do not hesitate, submit your next best results to SHOCK!

http://www.editorialmanager.com/shock.

## LAST WORDS ABOUT



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#### **NEWSLETTER**

#### Dear present ESS member,

If you like your ESS Spring Newsletter, please feel free to share it with your colleagues in the lab, department and/or institute. Perhaps, you could use this opportunity to suggest them to join us (a registration form can be found at the end of this Newsletter). Do not forget that we need you to keep improving our society so it stands proud and strong among other international Shock Societies.

This Newsletter, put together by your peers, belongs to you! We invite you to identify with it as members of the ESS. Moreover, we ask you to help us make it even better. Accordingly, we would be delighted to publish in our next issue any input you might be wishing to share with us (e.g. discussion on a given research/popular science topic, announce available positions in your lab, a contribution to the journal club corner, historical memories, comments about sepsis 3.0 etc.)

#### Dear past ESS member,

Please do not forget to renew your membership. We need all colleagues, junior and senior alike, to enable the ESS to host in its ranks the best representatives of the European Shock research - at the bedside and/or at bench alike.



Jean-Marc Cavaillon