



## *How to Use the Online Abstract Submission System for 8<sup>th</sup> World Congress of Biomechanics*

### ***Important Information***

- Abstracts are submitted via an online submission system. Register with the [abstract submission website](#) and establish your user name and password.
- If you are submitting more than one abstract you **must** use the same login for each abstract.
- Please note that at least one author **must** register in full to attend and present the abstract at the Congress and that an author **must not** present more than two presentations (either oral or poster).
- You can alter your abstract at any time up to the submission deadline of **19<sup>th</sup> December 2017**.
- Abstracts will be reviewed and any abstract that was submitted for oral presentation, but was unsuccessful in that regard, will be considered for poster presentation.
- The maximum length of an abstract is **450 words**. **Please ensure that research findings are described to a level sufficient for reviewers to make an informed decision on scientific quality. Abstracts that fail to meet these criteria will be rejected.**
- Do not include author names in the title or body of your abstract – these are entered online during the submission process.

## **1. The Submission Process**

Submitting an abstract is a **3-step process**. We strongly recommend that you complete your submission at one time.

### **Step 1: Register on the abstract submission system**

For the 8<sup>th</sup> World Congress of Biomechanics we are using a dedicated website for abstract submission. You must first register on the abstract submission system at <https://app.oxfordabstracts.com/events/123/submission>

### **Welcome.**

You will need to login / register first

Sign in here to manage your account or [Register a New Account](#)

Email address

Password

[Forgotten my password](#)

The first time you see this screen, you must register a new account, entering your name and e-mail address. You will also be asked to supply a password for the system.

You only need to register once - each subsequent time that you visit this page, you will log in with your e-mail and chosen password.

This information will be used by the event organiser to communicate with you about matters relating to the event. By clicking "Submit", you agree to our [terms of service](#) and [privacy policy](#).



**Step 2: Submit your abstract**

- Log in to the submission system when you have prepared your abstract - enter your email address and the password you chose when you registered.
- Submitting an abstract requires that you complete a questionnaire for each abstract. Some questions are mandatory (marked with an asterisk) and you will not be able to complete your submission until these questions have been answered. You will be required to provide the **names and affiliations of all authors, confirmation that all authors have approved the submission and the category and subcategory to which you are submitting your abstract.** You will also be able to indicate your preferred mode of presentation.
- **It is strongly recommended that you complete your submission once started. However, if you decide to start your submission for completion at a later point, you must ensure to “Submit” your incomplete abstract. It will then be available for you to finish at a later stage. Failure to “Submit” your incomplete abstract will result in it being lost and you will have to start again.**



**8th World Congress of Biomechanics**

Welcome to the abstract submission system for the 8th World Congress on Biomechanics.

The deadline for abstract submissions is **December 19th 2017**. Detailed instructions for submitting your abstract, together with a sample abstract, are available [here](#).

If you wish to apply for an award / bursary, all details are available [here](#).

We look forward to receiving your submission.

\* - indicates field is mandatory

**Title \***

Enter the full title of your submission using sentence case i.e. only capitalise the first letter of the first word and any proper nouns in the title). This will be used for printing in the final programme.

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Please enter the title of your abstract in sentence case. The maximum title length is 50 words.

Words: 17

Word Limit: 50

The links to this document and to the award/bursary section of the website are in the Welcome note.

**Mandatory questions are marked with an asterisk (\*) and must be answered. Your submission will not be complete if a mandatory question is left unanswered. Incomplete submissions will not go for review.**

Please enter the title of your abstract (**maximum length of 50 words**) – do NOT include author names or affiliations in the title.

**If you exceed the word count for either the title or abstract, your submission will be marked as incomplete in our system. Incomplete submissions will not go for review.**



### Abstract \*

Please enter an abstract of your paper (maximum 450 words).  
Do not include author names and affiliations.

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Enter the text of your abstract (maximum of 450 words). Do not include author names and affiliations.

You may also include one figure (using copy and paste functionality, with image compressed to 150ppi) and the following subsections are recommended.

- Introduction**
- Methods**
- Results**
- Discussion**
- Acknowledgements**
- References**

Words: 45

Word Limit: 450

### Author Approval \*

I confirm that this submission has been approved by all authors

Please enter the abstract of your paper, **(maximum length of 450 words)** – do NOT include any author names or affiliations as these are added at a later point. **Please ensure that research findings are described to a level sufficient for reviewers to make an informed decision on scientific quality. Abstracts that fail to meet these criteria will be rejected.**

Note: One figure can be included in your abstract – use the copy and paste functionality to add the figure. The resolution of the figure must have a maximum of 150 ppi.

You must also indicate that all authors have approved the submission.

### Affiliations and Authors

You MUST enter the names of ALL authors here - including yourself if you are an author - in the order in which you wish them to appear in the printed text. Names omitted here will NOT be printed in the author index or the final programme.

**Author 1** Remove Author

Title	First Name (Required)	Last Name (Required)
<input type="text" value="Dr."/>	<input type="text" value="A.N."/>	<input type="text" value="Other"/>

Presenting

Please give the names and affiliations for all authors. Each author can have up to 3 affiliations.

You must also indicate who the presenting author will be.

Once you have entered the details of the first author, you can add another author, if needed.

### Author 1 Affiliations

**Affiliation 1** Remove Affiliation

Institution	City	Country
<input type="text" value="RCSI"/>	<input type="text" value="Dublin"/>	<input type="text" value="Ireland"/>

+ Add Affiliation

Add Another Author



**Presenting Author E-mail**

Please supply the e-mail address of the presenting author

You must supply the e-mail address of the presenting author.

**Congress Track and Session \***

Please choose the congress track and session which best describe your submission.

Choose here ▼

- Choose here
- Biomedical engineering education
- Biofluid and transport
- Cardiovascular
- Cell biomechanics
- Emerging areas
- Imaging and device biomechanics
- Locomotion and human movement
- Molecular biomechanics
- Multiscale biomechanics
- Musculoskeletal
- Organ biomechanics
- Sport biomechanics, injury and rehabilitation
- Tissue biomechanics
- Tissue engineering
- Plenary session
- Society session

Please indicate to which congress track and session you are submitting your abstract. Please note that there are drop-down menus for both congress track and session.

Please choose the congress track and session which best describe your submission.

Imaging and device biomechanics ▼

Choose here ▼

- Choose here
- Advanced bioimaging
- Biofabrication and bioreactors for functional tissue systems
- Biomechanics of soft tissue by Elastography (MRI, US)
- Cardiovascular imaging
- Deformable (statistical and analytical) shape and appearance models in biomechanics
- Digital volume correlation strain measurements in biological tissues and biomaterials
- Dynamic medical imaging techniques for biomechanics systems
- Mechanical circulatory support
- Mechanical thrombectomy for emergent large vessel occlusion in acute ischemic stroke
- Nano- and micro-mechanics of biological tissue, biomimetic and bioinspired materials and systems
- Patient-specific biomechanical interaction of cardiovascular devices with surrounding tissues
- Physical regulators and transport cues in tissue engineering
- Rehabilitation methods, tools, and devices for ankle/foot
- Rehabilitation methods, tools, and devices for hand/wrist
- Rehabilitation methods, tools, and devices for hip/knee
- Rehabilitation methods, tools, and devices for shoulder
- Sports shoes, and sport surfaces
- Stenting within the cardiovascular system
- Synergy of image-based modelling and model-based imaging for probing biological systems



**Invited**

Is this an invited talk?

Yes

Please indicate if your talk is an invited talk (i.e., a written invitation was received by the session chair to give a keynote lecture for the session).

**Presenter biography**

**For Invited Presentations only**

Please provide a 3-4 sentence biography exactly how you would like it read for your introduction and printed in the conference program. Your biography is limited to 100 words. Please read your biography aloud once it is written to ensure it can be effortlessly delivered by the session chair.

Edit ▾

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Invited Presentation Only

Please provide a short biography (100 words)

Words: 10

Word Limit: 100

If your presentation is invited, please provide a short biography (maximum of 100 words).

**Author will attend \***

I confirm that at least one author will register in full to attend and present the paper at the Conference

**Permission to publish \***

Check this box to give us permission to publish your submission on electronic media (including website and app) and in hardcopy if it is accepted for presentation

Please confirm that at least one author will attend and present at 8<sup>th</sup> WCB.

You must also confirm that you give permission for your abstract to be published if accepted.

**Presentation \***

Please choose your preferred means of presentation.

Oral ▾

Choose here

Oral

Poster

Either

Please indicate your preferred presentation type – your options are oral, poster or either. Please note that the organizers are unable to guarantee granting your preference, and this is for planning purposes only.



### General Awards and Travel Bursaries

Please check the box(es) to be considered for the general awards and travel bursaries (you may apply for one society award and/or a travel bursary).

- European Society of Biomechanics (ESB) Clinical Biomechanics Award
- German Society of Biomechanics session: Experimental Biomechanics including Best Paper Award
- Japan Society of Mechanical Engineers session: Commemorative Lectures on Emerging Technologies for Biomechanics: Beyond the 120th anniversary of the JSME
- Société de Biomécanique session: Christian Oddou Award lecture and Young Investigator Awards
- World Council of Biomechanics Travel Award

### Student Awards

I wish to be considered for one of the student awards. Details of the awards are available on the congress website.

- European Society of Biomechanics (ESB) Student Award
- European Society of Biomechanics (ESB) Travel Award
- American Society of Mechanical Engineers – Bioengineering Division (ASME-BED) PhD Level Student Paper Competition and Student Travel Bursary
- American Society of Mechanical Engineers – Bioengineering Division (ASME-BED) MS Level Student Paper Competition
- American Society of Mechanical Engineers – Bioengineering Division (ASME-BED) BS Level Student Paper Competition
- American Society of Mechanical Engineers – Bioengineering Division (ASME-BED) Undergraduate Design Competition and Travel Bursary

### American Society of Mechanical Engineers – Bioengineering Division (ASME-BED) PhD Level Student Paper Competition and Student Travel Bursary - Technical Area

If you applied for the American Society of Mechanical Engineers – Bioengineering Division (ASME-BED) PhD Level Student Paper Competition and Student Travel Bursary, please indicate the most appropriate technical area for your work.

Choose here ▼

### Upload of Student Award Supporting Document

Please attach the supporting document for your student award application (**single pdf only**). This is essential for many of the awards and your application will not be considered without the supporting document. Please check the details on the congress website.

Max file upload size 10MB

Choose File

You may also indicate if you wish to apply for a general award or bursary. You may apply for one society award and/or a travel bursary.

If applicable, you may apply for a student award. Full details of these awards, together with supporting document requirements, are available on the website [www.wcb2018.com](http://www.wcb2018.com).

If you apply for the American Society of Mechanical Engineers – Bioengineering Division (ASME-BED) PhD Level Student Paper Competition and Student Travel Bursary, you must indicate the technical area for your work.

Furthermore, if you have applied for a student award, you **must** attach the supporting document (single pdf) for your application where necessary. Details of which awards require detailed supporting documents are available on the congress website.



### Student Travel Bursaries

I wish to be considered for one of the student travel bursaries. Details of the travel bursaries are available on the congress website.

- World Council of Biomechanics Student Bursary Awards: Asia/Pacific, Africa, Central and South America
- World Congress of Biomechanics 2018 Student Travel Bursary
- De Luca Foundation 'Motor Control' Student Travel Awards (only for students submitting an abstract to the 'Motor Control' session)

### Upload of Student Travel Bursary Supporting Document

Please attach the supporting document for your student travel bursary application (**single pdf only**). This is essential for many of the awards and your application will not be considered without the supporting document. Please check the details on the congress website.

Max file upload size 10MB

Choose File

If applicable, you may apply for a student travel bursary. Full details of these travel bursaries, together with supporting document requirements, are available on the website [www.wcb2018.com](http://www.wcb2018.com).

Furthermore, if you have applied for a student travel bursary, you **must** attach the supporting document (single pdf) for your application where necessary. Details of which awards require detailed supporting documents are available on the congress website.

Submit

**You must click “Submit” to complete your submission. If you fail to do so, your submission will be lost and you will have to start all over again. You can click “Submit” at any point during the submission process to save your information and return at a later date.**

8th World Congress of Biomechanics		<a href="#">New Submission</a>
08-07-2018 - 12-07-2018	Submission Deadline Date: 19-12-2017 Notification Date: 28-02-2018	
1. <u>Title of Abstract</u>		Incomplete
<a href="#">Amend</a>		

**If you should stop part way through the process, without pressing submit, your submission will be lost.**

However, if you press submit, your submission will be held in the system as an incomplete submission – you must return later and complete all the questions. When you log in again, you can click on your incomplete abstract and resume submission. Any incomplete question will be highlighted with a red border.



### **Step 3: Confirmation e-mail**

You will receive an e-mail confirming that your submission has been received. **The subject of the mail will indicate if your submission is complete or incomplete. An incomplete submission may have an answer that is unfinished or you may have exceeded the word limit for the abstract. Incomplete submissions will not go for review.** You **must** log back into the submission system, click on the title of the abstract and complete it. Once complete you will receive the confirmation e-mail.

8th World Congress of Biomechanics		<a href="#">+ New Submission</a>
08-07-2018 - 12-07-2018	Submission Deadline Date: 19-12-2017 Notification Date: 28-02-2018	
<u>1. Title of Abstract</u>		
<a href="#">Amend</a>	<a href="#">Complete</a>	

**If you wish to make another submission, please click on New Submission and a new blank submission form will open.**

## **2. Amending a Submission**

You may wish to change your submission. You can do this at any time up to the deadline of **19<sup>th</sup> December 2017**.

- Log in to the abstract submission system.
- You will see the abstract(s) that you have submitted. Click on the abstract title to open the file.
- Amending an abstract is just the same as the original submission process except that the online form will be automatically filled in with the answers that you gave previously. You don't have to change an answer if you don't want to.
- Once you click "Submit", your changes will be saved and you will be sent an email confirming that your abstract has been amended. **Your changes will not be recorded if you fail to click "Submit"**. You will also receive an e-mail confirming that an amendment has been made to your abstract.





### 3. Congress Tracks

Authors are welcome to submit under the following congress tracks:

- |                                  |   |
|----------------------------------|---|
| Biomedical engineering education | Multiscale biomechanics                       |
| Biofluid and transport           | Musculoskeletal                               |
| Cardiovascular                   | Organ biomechanics                            |
| Cell biomechanics                | Society session                               |
| Emerging areas                   | Sport biomechanics, injury and rehabilitation |
| Imaging and device biomechanics  | Tissue biomechanics                           |
| Locomotion and human movement    | Tissue engineering                            |
| Molecular biomechanics           |   |

### 4. Queries

If you have any queries about the submission process or you want to withdraw an abstract, please contact the congress administrator at [abstracts@wcb2018.com](mailto:abstracts@wcb2018.com)



## 5. Sample Abstract

**This is for information only – you must not enter your abstract as below as the abstract system captures the abstract in a series of steps.** However, you may use the section headings (Introduction, Methods etc.) and the output will be similar to the following.

### Oscillatory fluid shear induces MSC osteogenic lineage commitment in a magnitude and frequency dependent manner

Elena Stavenschi<sup>1,2</sup>, Marie-Noelle Labour<sup>1,2</sup>, David A. Hoey<sup>1,2,3</sup>

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<sup>3</sup>Advanced Materials and Bioengineering Research Centre, Royal College of Surgeons in Ireland and Trinity College Dublin, Dublin, Ireland.

#### Introduction

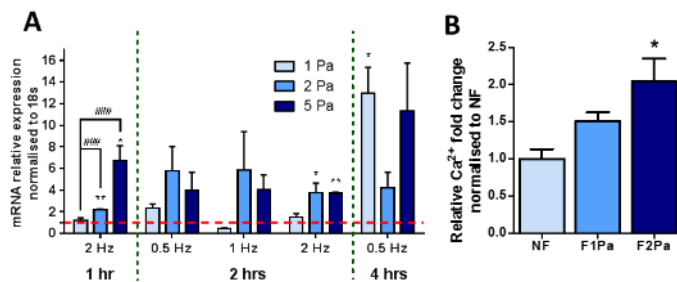
During daily ambulation, the skeletal system including the marrow experiences complex mechanical stimuli such as pressure and fluid shear that facilitates bone adaptation to loading [1]. It is currently unclear whether fluid shear predicted to occur within the marrow cavity is sufficient to directly drive osteogenic Mesenchymal Stem Cell (MSC) lineage commitment [2]. Therefore, the objective of this study is to conduct a systematic analysis of oscillatory fluid shear stress magnitude, frequency and duration on early osteogenic responses and to determine whether these mechanical stimuli are sufficient to drive osteogenic lineage commitment.

#### Methods

MSCs were cultured in standard growth media with minimal osteogenic supplements. Oscillatory fluid shear was applied using a custom built parallel plate flow chamber. The following flow regimes were employed: magnitudes of 1Pa, 2Pa and 5Pa were coupled with frequencies and time of stimulation such as 0.5Hz (2hrs, 4hrs), 1Hz (2hrs) and 2Hz (1hr, 2hrs). Long term flow mechanical stimulation consisted of 2 regimes: 1Pa, 1 Hz (F1Pa) and 2Pa, 2Hz (F2Pa) on Days 1, 2, 4, and 5 for 4 hrs/day followed by 14 days of static culture post flow. mRNA expression was quantified by qRT-PCR. Biochemical composition was evaluated for collagen using PicroSirius Red and Alizarin Red for mineralisation.

#### Results

Overall, MSCs stimulated with oscillatory fluid shear display positive but variable responses as determined by the upregulation of osteogenic genes Cox2, Runx2 and Opn. Cox2 mRNA expression is upregulated in a magnitude dependent manner as evidenced at 1hr, whereas at 2 hrs the level of upregulation plateaus at magnitudes above 2 Pa (Fig.1A). A positive osteogenic response in terms of Runx2 and OPN mRNA expression is observed, although independent of shear stress magnitude. Runx2 and Opn mRNA expression exhibits an increase with increasing frequency in response to shear stress magnitude above 2Pa. Duration of stimulation does not significantly influence MSC osteogenic responses. Long term fluid flow mechanical stimulation induced an increase in collagen deposition. Enhanced mineralisation is also observed with fluid flow, although a significant increase was only observed for 2Pa, 2Hz regime (Fig1B).



**Fig.1:** The effect of oscillatory fluid shear (A) magnitude, frequency and duration on Cox2 mRNA expression (short-term) and (B) Calcium deposition (long-term).

#### Discussion

This systematic study has identified that a regime of 2Pa shear and 2Hz frequency, which is predicted to occur in-vivo, induces the most robust and reliable upregulation in osteogenic gene expression. Furthermore, long-term mechanical stimulation utilising this flow regime, elicits a significant increase in collagen and mineral deposition demonstrating that bone marrow biophysical cues can directly drive MSC osteogenesis.

#### Acknowledgements

ERC n°336884 and SFI n°SFI/13/ERC/L2864.

#### References

- Chen, J.C., et al., (2015). *Faseb j*, **30**(4) p1504
- Govey, P.M., et al., (2013). *Curr Osteoporos Rep*, **11**(2) p83