**Answers to the Editors and to the Reviewers:**

**Editorial comments:**

Changes to be made by the author(s) regarding the manuscript:

1. Please take this opportunity to thoroughly proofread the manuscript to ensure that there are

no spelling or grammar issues. Checked

2. Please obtain explicit copyright permission to reuse any figures from a previous publication.

Explicit permission can be expressed in the form of a letter from the editor or a link to the

editorial policy that allows re-prints. Please upload this information as a .doc or .docx file to

your Editorial Manager account. The Figure must be cited appropriately in the Figure Legend,

i.e. “This figure has been modified from [citation].” Permission to reproduce Figures 1 and 7 are attached

3. Please remove the embedded figure(s) from the manuscript. Please include all the Figure

Legends together at the end of the Representative Results in the manuscript text. Figures and captions are at the end of the Representative Results section

4. Figure 1: Please include a title for the figure. All figures have captions

5. Figure 2: Please explain what panels A and B are. Added an explanation

6. Please provide an email address for each author. Added email addresses

7. Keywords: Please provide at least 6 keywords or phrases. Added 2 more keywords

8. Please adjust the numbering of the Protocol to follow the JoVE Instructions for Authors.

For example, 1 should be followed by 1.1 and then 1.1.1 and 1.1.2 if necessary. Please refrain

from using bullets, dashes, or indentations. Changed accordingly

9. JoVE cannot publish manuscripts containing commercial language. This includes trademark

symbols (™), registered symbols (®), and company names before an instrument or reagent.

Please remove all commercial language from your manuscript and use generic terms instead.

All commercial products should be sufficiently referenced in the Table of Materials and

Reagents. You may use the generic term followed by “(see table of materials)” to draw the

readers’ attention to specific commercial names. Examples of commercial sounding language

in your manuscript are: Laurell, UVP CL-1000, Gravograph, PlasmaTherm, Technics RIE, TA

Instruments, ORIGIN Pro, IGOR, etc. Commercial Language was removed

10. Please revise the protocol text to avoid the use of any personal pronouns (e.g., "we",

"you", "our" etc.). Changed accordingly

11. Please revise the protocol to contain only action items that direct the reader to do

something (e.g., “Do this,” “Ensure that,” etc.). The actions should be described in the

imperative tense in complete sentences wherever possible. Avoid usage of phrases such as

“could be,” “should be,” and “would be” throughout the Protocol. Any text that cannot be

written in the imperative tense may be added as a “Note.” Please include all safety procedures

and use of hoods, etc. However, notes should be used sparingly and actions should be

described in the imperative tense wherever possible. Please move the discussion about the

protocol to the Discussion. Changed accordingly

12. 1.2: Please specify the spin speeds and times used in this step. We have added Figure 2 showing spin curves and have added the spin speed for one thickness as an example.

13. 4.1: Please point out the specific steps that are being repeated here. The protocol was revised

14. Please include single-line spaces between all paragraphs, headings, steps, etc. Spaces were added

15. After you have made all the recommended changes to your protocol (listed above), please

highlight 2.75 pages or less of the Protocol (including headings and spacing) that identifies the

essential steps of the protocol for the video, i.e., the steps that should be visualized to tell the

most cohesive story of the Protocol. Parts have been highlighted in yellow.

16. Please highlight complete sentences (not parts of sentences). Please ensure that the

highlighted part of the step includes at least one action that is written in imperative tense.

17. Please include all relevant details that are required to perform the step in the highlighting.

For example: If step 2.5 is highlighted for filming and the details of how to perform the step

are given in steps 2.5.1 and 2.5.2, then the sub-steps where the details are provided must be

highlighted. Steps 2.2.x and 2.3.x were not highlighted, because they include only detailed measuring parameters. Including them would exceed the 2.75 page limit.

18. Discussion: As we are a methods journal, please also discuss critical steps within the

protocol and any limitations of the technique. Additional limitations were added.

19. Reference 1: Please do not abbreviate journal titles. Changed accordingly

20. Table of Equipment and Materials: Please remove trademark (™) and registered (®)

symbols. Please sort the items in alphabetical order according to the Name of Material/

Equipment. Trademarks were removed and items were ordered in alphabetical order.

**Reviewers' comments:**

**Reviewer #1:**

Manuscript Summary:

The article presents a new in-situ method for characterisation of implant materials. Although

compatible tests machines are commercial available for such tests, the simple modification a

"standard DMA" machine is convincing. The visual presentation is plausible.

Minor Concerns:

Please introduce the abbreviation DMA in abstract and introduction. We have added this accordingly.

l. 209 - 212: Please comment the limitation of the machine for testing only of specific samples

geometries. Mark this part less general.

We have added the following paragraph to the Discussion section: “The herein described results were measured on polymer films in tension mode. However, the environmental DMA is also capable of measurements in compression and in shear when using the respective fixture, and therefore allows for the measurement of other sample geometries as well. It should be noted that the available space inside the immersion beaker is limited and therefore the size of samples used for measurements inside this beaker are restricted by that size.

Another limitation of this method is that the load cell which is used to detect the forces generated by the samples during the measurement (in dry and in wet conditions). The load cell can only measure forces up to 35 N and therefore limits the sample size/geometry as well.”

**Reviewer #2:**

Manuscript Summary:

The manuscript discusses an experimental protocol for in vitro dynamic mechanical analysis

of polymers for neural implants. The authors' work is based on their previous work on shape

memory polymer-based implants and here they show how the softening of these polymers can

be characterized experimentally. The in vitro approach could help predict softening of the

polymers in vivo. This is a well written manuscript, but this reviewer did have some concerns

which the authors may want to address.

Major Concerns:

1. Protocol Step 1.2: Authors could give an idea (perhaps in the form of a plot) about the

relationship between spin speeds/time and viscosity/thickness. We have added Figure 2 showing spin curves and have added the spin speed for one thickness as an example.

2. Protocol Step 3.4: Authors could elaborate on this step. Video would probably be helpful,

but Figure 3C is difficult to understand and so could be replaced with a magnified image. In

addition, it could be supplemented with an image of a centered and properly aligned specimen. We have added Figure 5 showing the correct alignment of the sample.

3. Authors could comment on how the corresponding variation in softening would be for an in

vivo medium considering the difference in medium environment.

We have added the following paragraph to the Discussion section: “However, measuring in PBS is just one approach to mimic the biological environments. In vivo conditions may vary in many aspects, such as ion concentrations, availability of antibodies, proteins, and other species inside the biological medium/tissue. Depending on the targeted area, one could also consider using different media for the environmental measurements, such as tris-buffered saline (TBS), TBS-T (TBS with Polysorbate 20), Bovine serum albumin (BSA), Cerebrospinal fluid (CSF), or other body fluids.”

Minor Concerns:

4. Two sessions of measurements take place, one in PBS (Protocol Step 4.1) and two in air

(Protocol Step 4.2). Measurement as stated in Protocol Step 4.1 supposedly takes place after

Protocol Step 3.5. The step saying "following the above mentioned procedures" sounds a little

confusing. The protocol was revised. Dry and wet measurements are now two separate sections.

5. Please update reference 9 since it has already been published. Reference was updated.