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## Disk Degeneration and Pain

“God whispers to us in our pleasures, speaks to us in our conscience, but shouts in our pains: It is His megaphone to rouse a deaf world.”

—C.S. Lewis (1898-1963)

It has been our sincerest honor to have guest-edited this focus issue on “Disk Degeneration and Pain” for the Global Spine Journal. Of particular importance is that this issue commemorates the “first” focus issue of our newly developed journal, which we hope will be one of many more to come.

In a recent publication by Vos et al,[1] published by The Lancet, low back pain was identified as “the leading” debilitating condition worldwide, representing a tremendous socioeconomic and health care burden. Although not always synonymous with each other, disk degeneration is regarded as one of the determinants related to the development of low back pain. As such, disk degeneration and low back pain have gained the attention of the medical, scientific, and public interest for many years. Nevertheless, these conditions are complex and multi-factorial, and their development and management continue to challenge spine specialists and researchers alike. Therefore, in an effort to expound on matters, we have tailored a unique focus issue composed of multi-disciplinary international experts that have come together in an effort to raise awareness of the current cutting-edge issues surrounding disk degeneration and pain, ranging from imaging and pathomechanisms to novel treatments. Adhering to review-style papers, this focus issue addresses the following:

Fenty et al elaborate on the novel imaging modalities that have been developed to assess the disk in a more sensitive manner than traditional imaging. Also, the authors illustrate how such technology can assist to image pain, and have utility in clinical decision-making and practice.

Samartzis et al have provided an article that for the first time provides an extensive discussion as to how body fat can lead to the development of disk degeneration and low back pain. In an age where overweight and obesity as well as lack of physical activity are increasing in prevalence worldwide, the article stresses the need to address adiposity and its inflammatory agents as unique risk factors related to spinal changes and their role in personalized spine care.

Ito and Creemers, Lotz et al, Hiyama et al, and Wuertz and Haglund address distinct mechanisms that play a role as pain generators of the disk and endplate. These reports further highlight the complexities of pain arising from various regions of the anterior portion of the motion segment, their individual contributions in path pathways, and understanding for future therapeutic interventions.

Mwale as well as Erwin report on the novel therapeutic technologies that can lead to regeneration or progression-modification of the degenerated disk and/or act as analgesic agents in the setting of discogenic back pain. These reports further highlight the pros and cons of the cutting-edge technology that exists and the need to be more patient-specific when tailoring therapeutic interventions.

Purmessur et al report their findings stemming from an exhaustive systematic review of the literature addressing candidates located in or derived from the notochord or notochordal cells and their efficacy in addressing discogenic back pain. The authors' findings substantiate the need to further explore specific factors and mechanisms to validate the role of these candidates in their target use.

Such a focus issue is not accomplished without the devotion and sacrifice by many. In that sentiment, we would first like to acknowledge our families for all their support and understanding throughout this process. We are in debt to Chi Lam and Thea Swanson, whose help in coordinating this special issue was instrumental in keeping the work timely and topical. We would also like to thank the editorial board for their support of this project. In particular and of utmost importance, we wish to thank all the contributing authors who gave wholeheartedly of their time and insights to our relatively new journal, who believed in the educational value of this project, and who continue to strive on a daily basis to advance the spine field. We sincerely thank you for taking this journey with us, and supporting the journal in this initiative and in many others to come.

In closing, it is our sincerest intention that you, the reader, find this work to be informative and educational. We hope we have provided a current and unique perspective on the topic of disk degeneration and pain, and hopefully this focus issue may inspire and lead to new research platforms in the years ahead. Perhaps most poignant, we hope this focus issue serves as a needed "megaphone" in the struggle against pain development and management, and in so doing improve upon spine care, patient outcomes, and individual quality of life across borders.

## 椎間盤退變和疼痛

“上帝在我們的歡樂裡輕聲細語，在我們的良知裡揚聲述說，但卻在我們的苦難裡大聲吶喊：痛苦是上帝用來喚醒這個世界的麥克風。”

- 魯益師 (1898-1963)

這是我們衷心的榮譽為 *Global Spine Journal* 當這期焦點為“椎間盤退變和疼痛”的客席編輯。尤其重要的是，這一期是為了紀念我們這新開發的期刊的“第一個”焦點期號，我們期望還有更多。

Vos et al [1] 的最近的一份文獻在“柳葉刀”(The Lancet) 醫學期刊發表，下腰痛被認為“領先”造成全球衰弱的情況，代表一個極大的社會經濟和醫療負擔。雖然並不總是相同的，椎間盤退變被認為是與下腰痛的發展有關的決定因素之一。因此，多年來椎間盤退變及下腰痛已經獲得了醫療，科研和公共利益的關注。然而，這些情況是複雜的和多因素，其發展和治療方式不斷挑戰脊柱專科醫生和相關的研究人員。因此，在努力闡釋以上事宜，我們量身定做了這期獨特焦點性的一期，由多學科的國際專家一起組成，努力提高認識當前圍繞椎間盤退變和疼痛最前線的研究，從成像和病理機制，至最新的治療方法。秉承回顧風格的文章，這個焦點的一期包括以下的內容：

Fenty et al 詳細說明已經開發了的新穎的成像方式比傳統的成像以更敏感的方法評估椎間盤。此外，作者說明了這種技術如何可以協助圖像疼痛，並對臨床決策和實行有實用性。

Samartzis et al 提供了一篇文獻，是第一次廣泛地討論體內脂肪如可導致椎間盤退變和下腰痛。在這樣一個時代，其中超重和肥胖，缺乏體力活動以及在全世界的發病率都在增加，文章強調探討肥胖及炎症介質作為與脊柱變化有關的獨特風險因素和它們在個人化脊椎保健的角色的需要。

Ito 和 Creemers, Lotz et al, Hiyama et al, 和 Wuertz 和 Haglund 探討獨特的機制在椎間盤和終板引起疼痛所擔當的角色。這些文獻指示出由運動節段前部各地區產生疼痛的複雜性，他們各自都撰寫了關於通路，並進一步了解今後治療的干預措施。

Mwale 以及 Erwin 都報告了新的治療技術，這可令退變的椎間盤再生或改變當中的進展和/或能對椎間盤源性腰痛作為鎮痛劑。這些文獻進一步突顯現存尖端技術的利弊，並且在訂下治療干預時需針對個別病人的需要性。

Purmessur et al 報告他們的發現源於一個詳盡的系統性文獻回顧探討其椎間盤源性腰痛的研究對象是位於或來自脊索或脊索細胞和其療效。作者的研究結果證實需要進一步探討具體因素和機制，以驗證這些對象在目標使用時的作用。

如果沒有許多人的奉獻和犧牲，這樣焦點性的一期是沒法完成的。我們首先要感謝我們的家人，在整個過程中的所有支持和理解。我們很感激 Chi Lam 和 Thea Swanson 幫忙協調這特別的一期的工作適時安排及主題性。我們也感謝編委對這個項目的支持。最重要的是，我們要感謝所有撰稿人在時間和見解上全心全意給我們這本相對較新的期刊，他們是相信這個項目的教育價值和在關於脊柱的範疇上每天不斷努力。我們衷心感謝和我們經歷這啟旅程，並支持這期刊在這方面的領先，並隨著更多的。

總括而言，我們最誠摯的目的是你，讀者，覺得這期刊是資料豐富和教育性。我們希望我們在椎間盤退變和疼痛的題目提供了一個現行和獨特的角度，並希望這焦點性的一期可以在未來數年驅使和引領新的研究平台。也許最令人傷感的，是我們希望這焦點性的一期能在對疼痛的發展和處理的爭拗中作為一個急需的“傳聲筒”，透過跨國界的合作改善脊椎護理，患者的治療效果，及個人的生活質素。