

## Personal Information

Name: Markus O. Heller  
Citizenship: German  
Position: Professor of Biomechanics, University of Southampton  
Email: [m.o.heller@soton.ac.uk](mailto:m.o.heller@soton.ac.uk)

Our research applies engineering principles to develop accurate and validated computational models of the mechanics of the human lower limb, which help us to understand the subject specific loading conditions and assess the risk of mechanical overload of the human skeleton. In doing so, we establish the scientific basis for the development and implementation of innovative, biomechanically driven concepts for maintaining skeletal health and function throughout the lifespan.

## Postgraduate Positions

2012 – present Professor of Biomechanics, University of Southampton  
2005 – 2012 Head of Musculoskeletal Biomechanics group, Charité – Universitätsmedizin Berlin, Germany  
1999 – 2004 Postgraduate research fellow, Charité, Universitätsmedizin – Berlin, Germany  
1997 – 1999 Postgraduate research fellow, University of Ulm, Germany

## Education

2012 PD in Experimental Surgery from the Charité – Universitätsmedizin Berlin, Germany  
2002 Ph.D. in Human Biology from the University of Ulm, Germany  
1997 MS in Aeronautical and Astronautical Engineering from the University of Stuttgart, Germany

## Editorial Board Member

Journal of Orthopaedic Trauma

## Other

Member of the Research Sub-Committee of Arthritis Research UK  
Reviewer for German Research Foundation  
Treasurer of the German Society of Biomechanics

## Honours

Best Study and best Presentation Award of the Arbeitsgemeinschaft für Arthroskopie (AGA) 2011  
Young Investigator Award of the German Society for Biomechanics (DGfB) 2009  
Young Investigator Award of the Society for Orthopaedic Traumatologic Sports Medicine (GOTS) 2008  
S. M. Perren Award of the European Society of Biomechanics (ESB) 2002  
Clinical Biomechanics Award of the European Society of Biomechanics (ESB) 2000  
New Investigator Recognition Award of the Orthopaedic Research Society (ORS) 2000

## Third-party Funds (main grants since 2005)

### UK based funding

EPSRC Grant as Co-PI (EP/K034847/1 Unicompartmental Knee Arthroplasty, 2013)	£470,000
EPSRC KTS Grant with Simpleware (2013)	£55,000

### EC funding

Coordinator of MXL FP7-ICT-2009.5.2 (2010) Total EC contribution €3,700,000, contribution for own group €604,000	
VPHOP FP7-ICT-2-5.3 (2008)	contribution for own group €250,000
DeSSOS FP6-IST-27252	contribution for own group €826,000

### German national funding

Berlin-Brandenburg Center for Regenerative Therapies (BCRT) (2006)	contribution for own group €833,000
German Research Foundation (incl. Collaborative Research Centre 760)	total contribution for own group €778,000

### Industrial funding

Zimmer, Aesculap	total contribution for own group €615,000
------------------	---

**h-factor: 26; number of citations: > 3,500 ([google scholar](#)); last accessed 15.05.2014**

## **Peer-reviewed publications: First and last Authorships**

- |  | <b>Impact Factor (IF)</b> |
|--|---------------------------|
| 1. Trepczynski A., Kutzner I., Bergmann G., Taylor W.R., <b>Heller M.O.</b><br>Modulation of the relationship between external knee adduction moments and medial joint contact forces across subjects and activities.<br>Arthritis & Rheumatology [2014]; 66(5):1218-27  | <b>7.5</b>                |
| 2. Wassilew G. I.*, Janz V.*, <b>Heller M. O.*</b> , Tohtz S., Rogalla P., Hein P., Perka C. Real time visualization of femoroacetabular impingement and subluxation using 320-slice computed tomography.<br>J Orthop Res [2013]; 31(2):275-81   | <b>2.8</b>                |
| 3. Wassilew G.I.*, <b>Heller M.O.*</b> , Diederichs G., Janz V., Wenzel M., Perka C.<br>Standardized AP radiographs do not provide reliable diagnostic measures for the assessment of acetabular retroversion.<br>J Orthop Res [2012]; 30(9): 1369-1376  | <b>2.8</b>                |
| 4. Wassilew G. I.*, Hasart O.*, <b>Heller M.O.*</b> , Perka C., Südhoff I., Janz V., Seeger J.B., König C.<br>Ultrasound-based computer navigation: an accurate measurement tool for determining combined anteversion.<br>Technol Health Care [2012]; 20(6): 535-43  |                           |
| 5. Szwedowski T.D.*, Taylor W.R.*, <b>Heller M.O.*</b> , Perka C., Müller M., Duda G.N.<br>Generic rules of mechano-regulation combined with subject specific loading conditions can explain bone adaptation after THA.<br>PloS ONE [2012]; 7(5): e36231   | <b>4.1</b>                |
| 6. Taylor W.R.*, Szwedowski T.D.*, <b>Heller M.O.*</b> , Perka C., Matziolis G., Müller M., Janshen L., Duda G.N.<br>The difference between stretching and splitting muscle trauma during THA seems not to play a dominant role in influencing periprosthetic BMD changes.<br>Clin Biomech [2012]; 27(8):813-8 | <b>2.0</b>                |
| 7. Müller M., Schwachmeyer V., Tohtz S., Taylor W.R., Duda G.N., Perka C., <b>Heller M.O.</b><br>The direct lateral approach: Impact on gait patterns, foot progression angle and pain in comparison to a minimally invasive anterolateral approach.<br>Arch Orthop Trauma Surg [2012]; 132(5): 725-31         | <b>1.4</b>                |
-

- |   | <b>IF</b>  |
|---|------------|
| 8. Trepczynski A., Kutzner I., Kornaropoulos E., Taylor W.R., Duda G.N., Bergmann G., <b>Heller M.O.</b><br>Patello-femoral joint contact forces during activities with high knee flexion.<br>J Orthop Res [2012]; 30(3): 408–15                                    | <b>2.8</b> |
| 9. Wassilew G. I*., <b>Heller M.O.*.</b> Hasart O.*, Perka C., Südhoff I., Janz V., Duda G.N., König C.<br>Ultrasound-based computer navigation of the acetabular component: a feasibility study Arch Orthop Trauma Surg [2011]; 132(4): 517-525                    | <b>1.4</b> |
| 10. König C., Matziolis G., Sharenkov A., Taylor W.R., Perka C., Duda G.N., <b>Heller M.O.</b><br>Collateral ligament length change patterns after joint line elevation may not explain midflexion instability following TKA.<br>Med Eng Phys [2011]; 33(10):1303-8 | <b>1.6</b> |
| 11. <b>Heller M.O.</b> , Mehta M., Taylor W.R., Kim D.-Y., Speirs A., Duda G.N., Perka C.<br>Influence of prosthesis design and implantation technique on implant stresses after cementless revision THR.<br>J Orthop Surg Res [2011]; 6(1):20                      |            |
| 12. <b>Heller M.O.</b> , Kratzenstein S., Ehrig R.M., Wassilew G., Duda G.N., Taylor W.R.<br>The weighted Optimal Common Shape Technique improves identification of the hip joint centre of rotation in vivo.<br>J Orthop Res [2011]; 29(10):1470-5                 | <b>2.8</b> |
| 13. Ehrig R.M, <b>Heller M.O.</b> , Kratzenstein S., Duda G.N., Trepczynski A., Taylor W.R.<br>The SCoRE residual: A quality index to assess the accuracy of joint estimations.<br>J Biomech [2011]; 44(7): 1400-4  | <b>2.4</b> |
| 14. Taylor W.R., Pöpplau B.M., König. C, Ehrig R.M., Zachow S., Duda G.N., <b>Heller M.O.</b><br>The medial-lateral force distribution in the ovine stifle joint during walking.<br>J Orthop Res [2011]; 29(4): 567-71  | <b>2.8</b> |
| 15. König C., Sharenkov A., Matziolis G., Taylor W.R., Perka C., Duda G.N., <b>Heller M.O.</b><br>Joint line elevation in revision TKA leads to increased patellofemoral contact forces.<br>J Orthop Res [2010]; 28(1): 1-5   | <b>3.0</b> |
-

16. Kornaropoulos E.I., Taylor W.R., Duda G.N., Ehrig R.M., Matziolis G., Müller M., Wassilew G., Asbach P., Perka C., **Heller M.O.**  
Frontal plane alignment: An imageless method to predict the mechanical femoral-tibial angle (mFTA) based on functional determination of joint centers and axes.  
Gait Posture [2010]; 31(2): 204-8 **2.3**
17. Taylor W.R., Kornaropoulos E.I., Duda G.N., Kratzstein S., Ehrig R.M., Arampatzis A., **Heller M.O.**  
Repeatability and reproducibility of OSSCA, a functional approach for assessing the kinematics of the lower limb.  
Gait Posture [2010]; 32(2): 231-6 **2.3**
18. Goudakos I.G., König C., Schöttle P.B., Taylor W.R., Hoffmann J.E., Pöpplau B., Singh N.B., Duda G.N., **Heller MO.**  
Regulation of the patellofemoral contact area: an essential mechanism in patellofemoral joint mechanics?  
J Biomech [2010]; 43(16): 3237-9 **2.5**
19. Goudakos I.G., König C., Schöttle P.B., Taylor W.R., Singh N.B., Roberts I., Streitparth F., Duda G.N., **Heller MO.**  
Stair climbing results in more challenging patellofemoral contact mechanics and kinematics than walking at early knee flexion under physiological-like quadriceps loading.  
J Biomech [2009]; 42(15): 2590-6 **2.7**
20. Schöttle P., Goudakos I., Rosenstiel N., Hoffmann J-E, Taylor W.R., Duda G.N., **Heller M.O.**  
A comparison of techniques for fixation of the quadriceps muscle-tendon complex for in vitro biomechanical testing of the knee joint in sheep.  
Med Eng Phys [2009]; 31(1): 69-75 **1.7**
21. **Heller M.O.**, König C., Graichen H., Hinterwimmer S., Ehrig R. M., Duda, G. N., Taylor W. R.  
A new model to predict in vivo human knee kinematics under physiological-like muscle activation.  
J Biomech [2007]; 40(S1): 45-53 **2.9**

	IF
22. <b>Heller M.O.</b> , Schröder J.H., Matziolis G., Sharenkov A., Taylor W.R., Perka C., Duda G.N. Muskuloskeletale Belastungsanalysen. Biomechanische Erklärung klinischer Resultate – und mehr? Orthopäde [2007]; 36(3): 188-94	0.7
23. Ehrig R.M., Taylor W.R., Duda G.N., <b>Heller M.O.</b> A survey of formal methods for determining functional joint axes. J Biomech [2007]; 40(10): 2150-7	2.9
24. Ehrig R.M., Taylor W.R., Duda G.N., <b>Heller M.O.</b> A survey of formal methods for determining the centre of rotation of ball joints. J Biomech [2006]; 39(15): 2798-809.	2.5
25. Taylor W.R., Ehrig R.M., Duda G.N., Schell H., Klein P., <b>Heller M.O.</b> On the influence of soft tissue coverage in the determination of bone kinematics using skin markers. J Orthop Res [2005]; 23(4): 726-34	2.9
26. <b>Heller M.O.</b> , Duda G.N., Ehrig R.M., Schell H., Seebeck P., Taylor W.R. Muskuloskeletale Belastungen im Schafshinterlauf: Mechanische Rahmenbedingungen der Heilung. Materialwissenschaft und Werkstofftechnik [2005]; 36(12): 775-80	
27. <b>Heller M.O.</b> , Bergmann G., Kassi J.-P., Claes L., Haas N.P., Duda G.N. Determination of muscle loading at the hip joint for use in pre-clinical testing. J Biomech [2005]; 38(5): 1155-63	2.4
28. <b>Heller M.O.</b> , Kassi J.P., Perka C., Duda G.N. Cementless stem fixation and primary stability under physiological-like loads in vitro. Biomed Tech [2005]; 50(12): 394-9	0.9
29. <b>Heller M.O.</b> , Taylor W.R., Perka C., Duda G.N. The influence of alignment on the musculo-skeletal loading conditions at the knee. Langenbecks Arch Surg [2003]; (388): 291-7	0.9

---

**IF**

30. **Heller M.O.**, Bergmann G., Deuretzbacher G., Claes L., Haas N.P., Duda G.N.  
ESB Clinical Biomechanics Award: Influence of femoral anteversion on proximal femoral loading: measurement and simulation in four patients.  
Clin Biomech [2001]; 16(8): 644-9 **1.3**
31. **Heller M.O.**, Bergmann G., Deuretzbacher G., Dürselen L., Pohl M., Claes L., Haas N.P., Duda G.N.  
Musculo-skeletal loading conditions at the hip during walking and stair climbing.  
J Biomech [2001]; 34(7): 883-93 **1.9**

## Peer-reviewed publications: Co-authorships

32. Bergmann G., Bender A., Graichen F., Dymke J., Rohlmann A., Trepczynski A., **Heller M.O.**, Kutzner I.  
Standardized Loads Acting in Knee Implants.  
PLoS ONE [2014]; 9(1): e86035 **4.1**
33. Moewis P., Boeth H., **Heller M.O.**, Yntema C., Jung T., Doyscher R., Ehrig R.M., Zhong Y., Taylor W.R.  
Towards understanding knee joint laxity: Errors in non-invasive assessment of joint rotation can be corrected.  
Med Eng Phys [2014]; 10.1016/j.medengphy.2014.03.017 **1.8**
34. Kutzner I., Trepczynski A., **Heller M.O.**, Bergmann G.  
Knee adduction moment and medial contact force – facts about their correlation during gait.  
PLoS ONE [2013]; 8(12): e81036 **4.1**
35. Boeth H., Duda G.N., **Heller M.O.**, Ehrig R.M., Doyscher R., Jung T., Moewis P., Scheffler S. U., Taylor W.R.  
ACL deficient patients with passive knee joint laxity have a decreased range of anterior-posterior motion during active movements.  
Am J Sports Med [2013]; 41(5):1051-7 **3.8**
36. Kainmueller D.,Lamecker H., **Heller M.O.**, Weber B., Hege H.-C., Zachow S.  
Omnidirectional Displacements for Deformable Surfaces.  
Medical Image Analysis [2013]; 17(4):429-41 **4.4**
37. Diederichs G., Köhlitz T., Kornaropoulos E., **Heller M. O.**, Vollnberg B. Scheffler S.  
Magnetic Resonance Imaging Analysis of Rotational Alignment in Patients With Patellar Dislocations.  
Am J Sports Med [2013]; 41(1):51-7 **3.8**
38. Singh N.B., König N., Arampatzis A., **Heller M.O.**, Taylor W.R.  
Extreme levels of noise constitute a key neuromuscular deficit in the elderly.  
PLoS ONE [2012]; 7(11): e48449 **4.1**

- 
39. Kratzenstein S., Kornaropoulos E.I., Ehrig R.M., **Heller M.O.**, Pöpplau B.M., Taylor W.R.  
Effective marker placement for functional identification of the centre of rotation at the hip. *Gait Posture* [2012]; 36(3):482-6 **2.1**
40. Moewis P., Wolterbeek N., Diederichs G., Valstar E.R., **Heller M.O.**, Taylor W.R.  
The quality of bone surfaces may govern the use of model based fluoroscopy in the determination of joint laxity.  
*Med Eng Phys* [2012]; 34(10): 1427–32 **1.6**
41. Hamacher D., Singh N.B., Van Dieën J.H., **Heller M.O.**, Taylor W.R.  
Kinematic measures for assessing gait stability in elderly individuals: A systematic review. *J R Soc Interface* [2011]; 8(65):1682-98 **4.4**
42. Herrmann S., König C., **Heller M.O.**, Perka C., Greiner S.  
Reverse shoulder arthroplasty leads to significant biomechanical changes in the remaining rotator cuff.  
*Journal of Orthopaedic Surgery and Research* [2011]; 6(1): 42
43. Wassilew G.I., **Heller M.**, Wenzl M., Perka C., Hasart O.  
Validation of a CT image based software for three-dimensional measurement of acetabular cup orientation. *Technol Health Care* [2011]; 19(3):185-93
44. Witt F., Schell H, **Heller M.O.**, Duda G.N.  
Die Bedeutung der Biomechanik bei der physiologischen Frakturheilung.  
*Osteologie* [2011]; 20(1): 17-22 **0.2**
45. Singh N.B., Arampatzis A., Duda G.N., **Heller M.O.**, Taylor W.R.  
Effect of fatigue on force fluctuations in knee extensors in young adults.  
*Philos Transact A Math Phys Eng Sci* [2010]; 368(1920):2783-98 **2.5**
46. Bergmann G., Graichen F., Rohlmann A., Bender A., Heinlein B., Duda G.N., **Heller M.O.**, Morlock M.M.  
Realistic loads for testing hip implants.  
*Bio-Medical Materials and Engineering* [2010];20(2):65-75 **0.6**
47. Mihalko WM, Saleh KJ, **Heller M.O.**, Mollard B, König C, Kammerzell S.  
Femoral neck cut level affects positioning of modular short-stem implant.
-

## Publications

---

	IF
48. Speirs A.D., <b>Heller M.O.</b> , Taylor W.R., Duda G.N., Perka C. Influence of changes in stem positioning on femoral loading after THR using a short-stemmed hip implant. Clin Biomech [2007]; 22(4): 431-9	1.6
49. Speirs A.D., <b>Heller M.O.</b> , Duda G.N., Taylor W.R. Physiologically based boundary conditions in finite element modelling. J Biomech [2007]; 40(10): 2318-23	2.9
50. Epari D.R., Taylor W.R., <b>Heller M.O.</b> , Duda G.N. Mechanical conditions in the initial phase of bone healing. Clin Biomech [2006]; 21(6): 646-55	1.5
51. Taylor W.R., Ehrig R.M., <b>Heller M.O.</b> , Schell H., Seebeck P., Duda G.N. Tibio-femoral joint contact forces in sheep. J Biomech [2006]; 39(5): 791-8	2.5
52. Duda G., Maldonado Z., Klein P., <b>Heller M.</b> , Burns J., Bail H. On the influence of mechanical conditions in osteochondral defect healing. J Biomech [2005]; 38(4): 843-51	2.4
53. Kassi J.-P., <b>Heller M.</b> , Stoeckle U., Perka C., Duda G.N. SM Perren Award of the ESb: Stair climbing is more critical than walking in pre-clinical assessment of primary stability in cementless THA in vitro. J Biomech [2005]; 38(5): 1143-54	2.4
54. Perka C., <b>Heller M.</b> , Wilke K., Taylor W.R., Haas N.P., Zippel H., Duda G.N. Surgical approach influences periprosthetic femoral bone density. Clin Orthop Related Res [2005]; 43(432): 153-9	1.5
55. Klein P., Opitz M., Schell H., Taylor W.R., <b>Heller M.O.</b> , Kassi J.-P., Kandziora F., Duda G.N. Comparison of unreamed nailing and external fixation of tibial diastases--mechanical conditions during healing and biological outcome. J Orthop Res [2004]; 22(5): 1072-8	2.7
56. Taylor W.R., <b>Heller M.O.</b> , Bergmann G., Duda G.N. Tibio-femoral loading during human gait and stair-climbing. J Orthop Res [2004]; 22(3): 625-32	2.7

## Publications

---

	<b>IF</b>
57. Schröder J., <b>Heller M.O.</b> , Matziolis G., Taylor W.R., Sharenkov A., Wulsch P., Duda G.N., Perka C. Belastungsoptimierte Operationsplanung von Hüftendoprothesen. Z Orthop Ihre Grenzgeb [2004]; 142(5): 515-6	<b>0.5</b>
58. Duda G.N., Mandruzzato F., <b>Heller M.</b> , Schütz M., Claes L., Haas N.P. Mechanische Grenzindikationen der unaufgebohrten Marknagelung. Unfallchirurg [2003]; 106(8): 683-9	<b>0.5</b>
59. Kleemann R.U., <b>Heller M.O.</b> , Stoeckle U., Taylor W.R., Duda G.N. THA loading arising from increased femoral anteversion and offset may lead to critical cement stresses. J Orthop Res [2003]; 21(5): 767-74.	<b>2.2</b>
60. Klein P., Schell H., Streitparth F., <b>Heller M.</b> , Kassi J.-P., Kandziora F., Bragulla H., Haas N.P., Duda G.N. The initial phase of fracture healing is specifically sensitive to mechanical conditions. J Orthop Res [2003]; 21(4): 662-9.	<b>2.2</b>
61. Maldonado Z.M., Seebeck J., <b>Heller M.O.W.</b> , Brandt D., Hepp P., Lill H., Duda G.N. Straining of the intact and fractured proximal humerus under physiological-like loading. J Biomech [2003]; 36(12): 1865-73	<b>2.0</b>
62. Duda G.N., Mandruzzato F., <b>Heller M.</b> , Kassi J.-P., Khodadadyan C., Haas N.P. Mechanical conditions in the internal stabilization of proximal tibial defects. Clin Biomech [2002]; 17(1): 64-72	<b>1.0</b>
63. Bergmann G., Deuretzbacher G., <b>Heller M.</b> , Graichen F., Rohlmann A., Strauss J., Duda G.N. Hip contact forces and gait patterns from routine activities. J Biomech [2001]; 34(7): 859-71	<b>1.9</b>

## Publications

---

- |   | <b>IF</b>  |
|---|------------|
| 64. Duda, G.N., Mandruzzato F., <b>Heller M.</b> , Goldhahn J., Moser R., Hehli M., Claes L., Haas N.P.<br>Mechanical boundary conditions of fracture healing: borderline indications in the treatment of unreamed tibial nailing.<br>J Biomech [2001]; 34(5): 639-50 | <b>1.9</b> |
| 65. Kassi J.P., Hoffmann J.E., <b>Heller M.</b> , Raschke M., Duda G.N.<br>Bewertung der Stabilität von Frakturfixationssystemen: Mechanische Vorrichtung zur Untersuchung der 3-D-Steifigkeit in vitro.<br>Biomed Tech [2001]; 46(9): 247-52                         | <b>0.4</b> |
| 66. Duda G.N., <b>Heller M.</b> , Albinger J., Schulz O., Schneider E., Claes L.<br>Influence of muscle forces on femoral strain distribution.<br>J Biomech [2001]; 31(9): 841-6  | <b>1.9</b> |

## Reviews

Tohtz S.W., **Heller M.O.**, Taylor W.R., Perka C., Duda G.N.  
Zur Biomechanik der Hüfte. Relevanz der Schafttorsion für Hüftkontaktkraft  
und Krafteinleitung bei Kurzschaftprothesen.  
Orthopäde [2008]; 37(9): 923-9

Duda G.N., Taylor W.R., Winkler T., Matziolis G., **Heller M.O.**, Haas N.P.,  
Perka C., Schaser K.D.  
Biomechanical, microvascular, and cellular factors promote muscle and  
bone regeneration.  
Exercise and Sport Sciences Reviews [2008]; 36: 64-70

**Heller M.O.**, Matziolis G., König C., Taylor W.R., Hinterwimmer S.,  
Graichen H., Hege H.C., Bergmann G., Perka C., Duda G.N.  
Muskuloskeletale Biomechanik des Kniegelenkes. Grundlagen für die  
präoperative Planung von Umstellung und Gelenkersatz.  
Orthopäde [2007]; 36(7): 628-34

Duda G.N., **Heller M.O.**, Bergmann G.  
Musculoskeletal loading database: loading conditions of the proximal  
femur.  
Theoretical Issues in Ergonomics Science [2005]; 6(3-4): 287-92

## Editorials/Comments/Letters to the Editor

Bergmann G., **Heller M.O.**  
Comments on: "Kerrigan D.C., Franz J.R., Keenan G.S., Dichary J., Della  
Croce U., Wilder R.P. The effect of running shoes on lower extremity  
torques. PM & R [2009]; 1(12): 1058-63"  
PM & R [2010]; 2(4): 310-11

Duda G.N., Haas N.P., **Heller M.O.**, Taylor W.R.  
Interaction of mechanics and biology in knee joint restoration and  
regeneration. From cells to limbs-multi-scale approaches for clinical  
applications. Berlin, 28-30 June 2006.  
J Biomech [2007]; 40(S1): S1-3

Kassi J.P., **Heller M.O.**, Stoeckle U., Perka C., Duda G.N.  
Response to: "Stair climbing is more critical than walking in pre-clinical  
assessment of primary stability in cementless THA in vitro".  
[J Biomech [2005]; 38: 1143-1154].  
J Biomech [2006]; 39(16): 3087-90

## Translations

J. Wolff

The Classic: On the Theory of Fracture Healing.

*This Classic article is a translation by **M.O. Heller**, W.R. Taylor, N. Aslanidis,  
and Georg N. Duda of the original work by Julius Wolff,  
Zur Lehre von der Fracturenheilung.*

Clinical Orthopaedics and Related Research [2010]; 468(4): 1052-5

J. Wolff

The Classic: On the Inner Architecture of Bones and its Importance for Bone Growth.

*This Classic article is a translation and abridgment by **M.O. Heller**, W.R. Taylor,  
N. Aslanidis, and Georg N. Duda of the original work by Julius Wolff,  
Ueber die Innere Architectur der Knochen und ihre Bedeutung für die Frage vom  
Knochenwachstum.*

Clinical Orthopaedics and Related Research [2010]; 468(4): 1056-65

## Book Chapters

Duda G.N., König C., Bergmann G., Tohtz S., Perka C., **Heller M.O.**

Biomechanics of the Artificial Hip.

in: Berry D.M., Lieberman J. (Editors): Surgery of the hip.

Elsevier, ISBN 9780443069918 [2013]

Duda G.N., **Heller M.O.**, Pfitzner T., Taylor W.R., König C., Bergmann G. Biomechanik  
des Kniegelenkes.

in: D.C. Wirtz (Editor): AE-Manual der Endoprothetik. Knie.

1st Edition 2011, DOI 10.1007/978-3-642-12889-9\_2 (13 Seiten)

**Heller M.O., Duda G.N.**

Die Bedeutung der Gelenkgeometrie für die muskuloskelettalen Belastungen nach THA.

in: C. Perka und H. Zippel (Editor): Trends und Kontroversen in der Endoprothetik des Hüftgelenkes.

Einhorn-Press Verlag, Reinbek [2002]:12-21

Duda G., **Heller M.**

Bedeutung der komplexen muskulo-skelettalen Beanspruchung für die Hüftendoprothetik.

in C. Perka und H. Zippel (Editor): Pfannenrevisionseingriffe nach Hüft-TEP.

Einhorn-Press Verlag, Reinbek [2000]: 17-19

## Selected Conference- Proceedings/Abstracts/Presentations

### 2013

*Subject-specific models of cemented hip replacements differentiate key group effects determined by RSA: a step towards robust, population-based estimates of implant performance?*

**Heller M.O.**, Shi J., Strickland M., Browne M., Taylor M., Flivik G.  
3<sup>rd</sup> International RSA Meeting, Lund, 2013

*Gender-specific statistical shape model of the femur for automated image-based anatomic parameter measurements*

Bah M.T., Shi J., Browne M., Suchier Y., Lefebvre F., Young P., Dunlop D., King L., **Heller M.O.**  
26<sup>th</sup> Annual Congress of the International Society for Technology in Arthroplasty (ISTA), West Palm Beach, 2013

*The prevalence of acetabular retroversion in asymptomatic adults.*

Wassilew G.I, **Heller M.O.**, Perka C.  
26<sup>th</sup> Annual Congress of the International Society for Technology in Arthroplasty (ISTA), West Palm Beach, 2013

*Mechanical causes and consequences of the osteonal remodelling in the ovine femur.*

Varga P., Pöpplau B., **Heller M.O.**, Raum K.  
5<sup>th</sup> European Symposium on Ultrasonic Characterization of Bone, Granada, 2013

*Non invasive assessment of knee joint rotational laxity is reliable but not necessarily accurate*

Moewis P., Boeth H., **Heller M.O.**, Yntema C., Doyscher R., Jung T., Ehrig R.M., Taylor W.R.  
19<sup>th</sup> Congress of the European Society of Biomechanics, Patras, 2013

*ACL deficient patients with passive knee joint laxity have a decreased range of anterior-posterior motion during active movements*

Boeth H., Duda G., **Heller M.O.**, Ehrig R.M., Doyscher R., Jung T., Moewis P., Scheffler S., Taylor W.R.  
19<sup>th</sup> Congress of the European Society of Biomechanics, Patras, 2013

*Modulation of the relationship between peak knee adduction moments and medial contact forces across subjects and activities*

Heller M.O., Trepczynski A., Kutzner I., Taylor W.R., Bergmann G.  
Transactions of the Orthop Res Soc, Vol. 38, San Antonio, TX, 2013

*Is the knee adduction moment a strong predictor for the medial contact force? - Facts about the correlation during gait*

Kutzner I., Trepczynski A., **Heller M.O.**, Bergmann G.  
Transactions of the Orthop Res Soc, Vol. 38, San Antonio, TX, 2013

*ACL-deficient patients with passive knee joint instability overcompensate during walking.*

Boeth H., Duda G.N., **Heller M.O.**, Ehrig R.M., Doyscher R., Jung T., Moewis P., Scheffler S., Taylor W.R.  
Transactions of the Orthop Res Soc, Vol. 38, San Antonio, TX, 2013

*Prävalenz der acetabulären Retroversion in einer asymptomatischen Population.*

Wassilew G., **Heller M.O.**, Perka C.  
Deutscher Kongress für Orthopädie und Unfallchirurgie DKOU 2013, Berlin

*Patienten mit passiver Knieinstabilität weisen während aktiver Bewegung eine verringerte anterior posteriore Translation auf*

Jung T., Duda G., Taylor W., **Heller M.O.**, Doyscher R., Kopf S., Moewis P., Boeth H.  
Deutscher Kongress für Orthopädie und Unfallchirurgie DKOU 2013, Berlin

## **2012**

*Das externe Knie-Adduktionsmoment alleine erlaubt keine verlässliche Aussage über die tibiofemorale Kontaktkraft: Eine Analyse über das Aktivitätsspektrum in 8 Patienten.*

Trepczynski A., Kutzner I., Taylor W.R., Bergmann G., Heller M.O.  
Deutscher Kongress für Orthopädie und Unfallchirurgie DKOU 2012, Berlin

*Das sagittale Schaftalignment in der Hüftendoprothetik – Einfluss auf die Antetorsion und den Bewegungsumfang*

Müller M., Heller M.O., Perka C., Tohtz S.  
Deutscher Kongress für Orthopädie und Unfallchirurgie DKOU 2012, Berlin

*The cross over sign is not a reliable diagnostic measure for the assessment of acetabular retroversion*

Heller M.O., Perka C., Wassilew G.I.

13th Congress of the European Federation of National Associations of Orthopaedics and Traumatology (EFORT), Berlin

*In vivo gluteus medius volume and shape variations across gender and disease status.*

**Heller M.O.**, Wurl A., Perka C., Hege H.-C.

18<sup>th</sup> Congress of the European Society of Biomechanics, Lisbon, 2012

*Peak knee adduction moments & medial contact forces – relations across subject and activities.*

Trepczynski A., Kutzner I., Taylor W.R., Bergmann G., **Heller M.O.**

18<sup>th</sup> Congress of the European Society of Biomechanics, Lisbon, 2012

Invited lecture:

*Kinetics and kinematics of normal gait.*

**Heller M.O.**

2<sup>nd</sup> Biennial International Congress of the Iranian Society of Knee Surgery, Arthroscopy & Sports Traumatology (ISKAST), Kish, Iran, 2012

Invited lecture:

*Biomechanics of the native, instable and MPFL reconstructed patellofemoral joint.*

**Heller M.O.**

2<sup>nd</sup> Biennial International Congress of the Iranian Society of Knee Surgery, Arthroscopy & Sports Traumatology (ISKAST), Kish, Iran, 2012

*The cross over sign is not a reliable diagnostic measure for the assessment of acetabular retroversion.*

**Heller M.O.**, Wassilew G.I., Diederichs G., Janz V., Wenzel M., Perka C.

Transactions of the Orthop Res Soc, Vol. 37, San Francisco, CA, 2012

## **2011**

*Rotational malalignment of the femur constitutes a dominating factor in patients with patellofemoral instability.*

Scheffler S.U., Kornaropoulos E., Diederichs G., Taylor W.R., **Heller M.O.**

8<sup>th</sup> Biennial ISAKOS Congress, Rio De Janeiro, Brazil, 2011

*Wo sollten Hautmarker angebracht werden und welche Anzahl wird benötigt, um die Hüftgelenksposition möglichst verlässlich aus Bewegungsdaten zu bestimmen?*

Kratzenstein S., Ehrig R., Kornaropoulos E., Plank F., **Heller M.O.**, Taylor W.R.  
7. Jahrestagung der Deutschen Gesellschaft für Biomechanik, Murnau, 2010

*The quality of bone surfaces might limit the use of model based fluoroscopy in the determination of joint laxity*

Moewis P., Wolterbeek N., Asbach P., Diederichs G., Wassilew G., Valstar E., **Heller M.O.**, Taylor W.R.  
7. Jahrestagung der Deutschen Gesellschaft für Biomechanik, Murnau, 2010

*Rotational alignment in patello-femoral instability.*

**Heller M.O.**, Kornaropoulos E.I., Scheffler S., Diederichs G., Taylor W.R., Duda G.N.  
7. Jahrestagung der Deutschen Gesellschaft für Biomechanik, Murnau, 2010

*Rotational malalignment of the femur: knee version as key factor of the patho-anatomy in patellofemoral instability.*

Kornaropoulos E.I., Scheffler S., Diederichs G., Taylor W.R., Duda G.N., **Heller M.O.**  
Transactions of the Orthop Res Soc, Vol. 36, Long Beach, CA, 2011

Invited lecture:

*Biomechanische Aspekte von Achsfehlstellungen: Statik vs. Dynamik*  
**Heller M.O.**  
AOTrauma-Seminar, Berlin 25.3.2011

*Targeted Marker Placement for the Functional Identification of the Hip Joint Centre.*

Taylor W.R., Kornaropoulos E.I., Kratzenstein S., Ehrig R., Plank F., **Heller M.O.**  
Transactions of the Orthop Res Soc, Vol. 36, Long Beach, CA, 2011

*Tissue Level Strains in Sheep and Human differ in Pattern, but not in Magnitude.*

**Heller M.O.**, Poepplau B., Szwedowski T.D., Taylor W.R., Duda G.N.  
Transactions of the Orthop Res Soc, Vol. 36, Long Beach, CA, 2011

Invited lecture:

Das große Offset.  
**Heller M.O.**  
Kongress Endoprothetik, Berlin, 10.2.2011

*Invited lecture:*

*Rolle der Belastungen für Erhalt und Wiederherstellung der Gelenkfunktion im Alter*

**Heller M.O.**

Seminar: Alles in Bewegung, Berlin, 31.1.2011

*Reconstruction of the medial patello-femoral ligament does not restore normal kinematics in patients with patello-femoral instability.*

**Heller M.O.**, Kornaropoulos E.I., Scheffler S., Trepczynski A., Duda G.N., Taylor W.R.

7. Jahrestagung der Deutschen Gesellschaft für Biomechanik, Murnau, 2010

*Large Variations of Patello-Femoral Joint Contact Forces During Highly Demanding Activities: Simulations and in vivo Measurements.*

Trepczynski A., Kutzner I., Taylor W.R., Duda G.N., Bergmann G., **Heller M.O.**

13<sup>th</sup> Congress of the International Society of Biomechanics (ISB), Brussels, 2011

*On the relationship between vastus medialis and vastus lateralis in patients with patello-femoral instability.*

Kornaropoulos E.I., Scheffler S., Diederichs G., Taylor W.R., Duda G.N.,

**Heller M.O.**

13<sup>th</sup> Congress of the International Society of Biomechanics (ISB), Brussels, 2011

*Normal knee kinematics are not restored after reconstruction of the medial patello-femoral ligament in patients with patello-femoral instability.*

**Heller M.O.**, Kornaropoulos E.I., Scheffler S., Trepczynski A., Duda G.N.,

Taylor W.R.

ISB, Brussels, 2011

*Increased knee version: a key anatomical factor in patello-femoral instability?*

Kornaropoulos E.I., Scheffler S., Diederichs G., Taylor W.R., Duda G.N.,

**Heller M.O.**

ISB, Brussels, 2011

## **2010**

*Computersimulationen und in vivo Messungen zeigen, dass die patello-femorale Kräfte beim Knie-TEP Patienten erheblich variieren.*

Trepczynski A., Kutzner I., Taylor W.R., Duda G.N., Bergmann G., **Heller M.O.**

Deutscher Kongress für Orthopädie und Unfallchirurgie, Berlin, 2010

*Navigierter Ultraschall erlaubt die präzise Pfannenpositionierung in der Hüftendoprothetik.*

König C., Hasart O., Sharenkov A., Mollar B., Südhoff I., **Heller M.O.**  
Deutscher Kongress für Orthopädie und Unfallchirurgie, Berlin, 2010

*Large Variations of Patello-Femoral Joint Contact Forces During Highly Demanding Activities: Simulations and in vivo Measurements.*

Trepczynski A., Kutzner I., Kornaropoulos E.I., Taylor W.R., Duda G.N., Bergmann G., **Heller M.O.**  
17<sup>th</sup> Congress of the European Society of Biomechanics, Edinburgh, 2010

*Tissue Level Straining in Sheep and Human differs in Pattern, but not Magnitude.*

Pöpplau B., Szwedoski T.D., Taylor W.R., Duda G.N., **Heller M.O.**  
17<sup>th</sup> Congress of the European Society of Biomechanics, Edinburgh, 2010

*Navigated Ultrasound Enables Accurate Cup Positioning in Total Hip Arthroplasty.*

König C., Südhoff I., Mollard B., Sharenkov A., Hasart O., **Heller M.O.**  
17<sup>th</sup> Congress of the European Society of Biomechanics, Edinburgh, 2010

*Graft Tension Determines Patellofemoral Biomechanics after Medial Patellofemoral Ligament (MPFL) Reconstruction.*

Goudakos I.G., Schöttle P.B., König C., Taylor W.R., Duda G.N., **Heller M.O.**  
17<sup>th</sup> Congress of the European Society of Biomechanics, Edinburgh, 2010

*Patello-Femoral Forces during Functionally Demanding Activities Predicted by a Validated Musculoskeletal Model.*

Trepczynski A., Kutzner I., Kornaropoulos E.I., Taylor W.R., Duda G.N., Bergmann G.N., **Heller M.O.**  
Transactions of the Orthop Res Soc, Vol. 35, New Orleans, LA, 2010

*The Significance of Graft Tension in Medial Patellofemoral Ligament (MPFL) reconstruction for Patellofemoral Biomechanics.*

Goudakos I., Schöttle P.B., König C., Taylor W.R., Duda G.N., **Heller M.O.**  
Transactions of the Orthop Res Soc, Vol. 35, New Orleans, LA, 2010

*Can midflexion instability after TKA be a consequence of joint line elevation?*

König C, Matziolis G, Sharenkov A, Taylor W.R., Duda G.N., Perka C., **Heller M.O.**  
Transactions of the Orthop Res Soc, Vol. 35, New Orleans, LA, 2010

*Computer assisted validation of femoral neck resection level for a modular metaphyseal short stem.*

Mihalko W. Saleh K., Mollard B., König C., **Heller M.O.**, Kammerzell S.  
Transactions of the Orthop Res Soc, Vol. 35, New Orleans, LA, 2010

**2009**

*Risiko der medialen Gelenküberlastung nach Rekonstruktion des medialen patellofemorales Ligaments (MPFL).*

Goudakos I., Schöttle P.B., König C., Duda G.N., **Heller M.O.**

Deutscher Kongress für Orthopädie und Unfallchirurgie, Berlin, 2009

*Ein bildfreies Verfahren zur Bestimmung des mechanischen femerotibialen Winkels (mFTW) auf Grundlage funktionell bestimmter Gelenkzentren und Gelenkachsen.*

Kornaropoulos E.I., Taylor W.R., Duda G.N., Ehrig R., **Heller M.O.**

Deutscher Kongress für Orthopädie und Unfallchirurgie, Berlin, 2009

*Remodelling rate variation can account for subject specific bone adaptation.*

Szwedowski T., Taylor W.R., Müller M., **Heller M.O.**, Duda G.N.

IV International Conference on Computational Bioengineering (ICCB), Bertinoro, Italy, 2009

*An imageless method to quantify the mechanical femoral-tibial angle based on the functional determination of joint centers and axes.*

Kornaropoulos E.I., Taylor W.R., Duda G.N., Ehrig R.M., **Heller M.O.**

18th Annual meeting of the European Society of Movement Analysis for Adults and Children (ESMAC), London, 2009

*Reduction of the influence of skin marker artefact using the Optimal Common Shape Technique*

Kratzenstein S., **Heller M.O.**, Ehrig R.M., Duda G.N., Kornaropoulos E.I.,

Taylor W.R.

18th Annual meeting of the European Society of Movement Analysis for Adults and Children (ESMAC), London, 2009

*Navigated Ultrasound in Total Hip Arthroplasty.*

Südhoff I., König C., Mollard B., Sharenkov S., Hasart O., **Heller M.O.**

11<sup>th</sup> World Congress on Medical Physics and Biomedical Engineering, Munich, 2009

*Regulation of Joint Contact Area is an Essential Mechanism for Maintaining Physiological Patellofemoral Joint Mechanics*

Goudakos I., König C., Schöttle P.B., Taylor W.R., Duda G.N., **Heller M.O.**

7th Biennial Congress of the International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Surgery (ISAKOS), Osaka, 2009

*An imageless method to determine the mechanical femorotibial angle (mFTA) based on the functional determination of joint centres and joint axes.*

Kornaropoulos E.I., Taylor W.R., Duda G.N., Ehrig R.M., **Heller M.O.**

6. Jahrestagung der Deutschen Gesellschaft für Biomechanik, Münster, 2009

*Bedeutung der Transplantatvorspannung für die Biomechanik des patellofemorales Gelenkes nach Rekonstruktion des medialen patellofemorales Ligaments (MPFL).*

Goudakos I., Schöttle P., König C., Taylor W.R., Duda G.N., **M.O. Heller**

6. Jahrestagung der Deutschen Gesellschaft für Biomechanik, Münster, 2009

*Automated extraction of anatomical landmarks from medical image data: an evaluation of different methods.*

Seim H., Kainmueller D., **Heller M.O.**, Zachow S., Hege H.-C.

6<sup>th</sup> IEEE International Symposium on Biomedical Imaging (ISBI'09), Boston, 2009

## 2008

*Relation Between Joint Anatomy, Contact Forces And Muscle Volume 10 Years Post Unilateral THR*

**Heller M.O.**, Hartwig T., Sharenkov A., Taylor W.R., Perka C.,

Duda G.N., Schröder J.H.

16<sup>th</sup> Congress of the European Society of Biomechanics, Lucerne, Switzerland

*Impact Of Muscle Load Level On Patello-femoral Contact Mechanics And Kinematics*

Goudakos I., König C., Schöttle P., Taylor W., Duda G., **Heller M.O.**

16<sup>th</sup> Congress of the European Society of Biomechanics, Lucerne, Switzerland

*Automatic Segmentation of the Pelvic Bones from CT Data Based on a Statistical Shape Model*

Seim H., Kainmueller D., **Heller M.O.**, Lamecker H., Zachow S., Hege H.-C.

Proceedings of the 1<sup>st</sup> Eurographics Workshop on Visual Computing for Biomedicine (EG VCBM), Delft, Netherlands, 2008

*Segmentation of bony structures with ligament attachment sites*

Seim H., Lamecker H., **Heller M.O.**, Zachow S.

Bildverarbeitung für die Medizin (BVM). Springer Verlag (2008), p. 206-211

*Multi-object Segmentation with Coupled Deformable Models*

Kainmueller D., Lamecker H., Zachow S., **Heller M.O.**, Hege H.-C.

Medical Image Understanding and Analysis (MIUA), Dundee, 2008.

*How important is joint line reconstruction in TKA? - A biomechanical investigation*

König C., Matziolis G., Sharenkov A., Taylor W.R., Perka C., Duda G.N.,  
**Heller M.O.**

Transactions of the Orthop Res Soc, Vol. 33, San Francisco, CA, 2008

*A New Geometrical Model to Predict the Patellar Tendon Angle at High Degrees of Knee Flexion*

Trepczynski A.S., Taylor W.R., König C., Matziolis G., Adamson R.L.,  
Duda G.N., Perka C., **Heller M.O.**

Transactions of the Orthop Res Soc, Vol. 33, San Francisco, CA, 2008

*Muscle activity impact on patello-femoral contact mechanics and kinematics during walking and stair climbing - an in vitro cadaveric study*

Goudakos I.G., König C., Schöttle P.B., Roberts I., Rosenstiel N.,  
Taylor W.R., Heller **M.O.**

Transactions of the Orthop Res Soc, Vol. 33, San Francisco, CA, 2008

*Hip Joint Contact Force, but not Femoral Neck Length is a Predictor of Abductor Muscle Volume after Unilateral Total Hip Replacement.*

Schröder J.H., Hartwig T., Sharenkov A., Taylor W.R., Duda G.N.,  
Perka C., **Heller M.O.**

Transactions of the Orthop Res Soc, Vol.33, San Francisco, CA, 2008

*Die Regulation der patellofemorale Kontaktfläche ist ein essentieller Mechanismus um die physiologische in vivo Biomechanik aufrecht zu erhalten.*

Goudakos I., König C., Schöttle P., Taylor W.R., Singh N., Pöplau B.,  
Duda G.N., **Heller M.O.**

23. Kongress der Ges. für Orthopädisch-Traumatologische Sportmedizin, München

## **2007**

*Welches Rotationszentrum ist bei der Planung des hüftendoprothetischen Gelenkersatzes zu präferieren?*

Hartwig T., Schröder J., **Heller M.**, Matziolis G., Duda G.N., Perka C.  
Deutscher Kongress für Unfallchirurgie und Orthopädie Berlin, 2007

*Wie zwingend ist die Rekonstruktion der Gelenklinie nach Knie-TEP aus biomechanischer Sicht?*

**Heller M.O.**, König C., Matziolis G., Taylor W.R., Perka C., Duda G.N.  
Deutscher Kongress für Unfallchirurgie und Orthopädie Berlin, 2007

*Simulation des periprothetischen Knochenbaus nach Hüft-TEP-Implantation in Abhängigkeit vom chirurgischen Zugangsweg*

Müller M., Henderson A., Taylor W., **Heller M.**, Tohtz S., Perka C.  
Deutscher Kongress für Unfallchirurgie und Orthopädie Berlin, 2007

*The collateral ligaments during active and passive knee flexion: an in vivo study*

König C., Matziolis G., Taylor W.R., Sharenkov A., Graichen H.,  
Hinterwimmer S., Duda G.N., **Heller M.O.**  
5. Jahrestagung der Deutschen Gesellschaft für Biomechanik, Köln, 2007

*The medio-lateral force distribution in the sheep knee during walking.*

Taylor W.R., König C., Speirs A., Ehrig R., Duda G.N., **Heller M.O.**  
Transactions of the Orthop Res Soc, Vol. 32, San Diego, CA, 2007

## 2006

*The symmetrical axis of rotation approach (SARA) for determination of joint axis in clinical gait analysis*

Taylor W.R., Ehrig E., Duda G.N., **Heller M.O.**  
ESMAC Amsterdam, 2006

*Can physiological loading of the proximal femur be reproduced with conservative hip implants?*

Speirs A.D., **Heller M.O.**, Taylor W.R., Duda G.N., Perka C.  
5th World Congress of Biomechanics, J Biomech 39(S1): S126, 2006

*A new approach for the determination of joint axes*

Ehrig R., Taylor W., Duda G., **Heller M.**  
Transactions Orthop Res Soc, Vol. 31, Chicago, IL, 2006

*Do short-stemmed hip implants provide physiological load transfer in the proximal femur?*

Speirs A., **Heller M.**, Taylor W., Duda G., Perka C.  
Transactions Orthop Res Soc, Vol.31, Chicago, IL, 2006

*Atlas-basierte 3D-Rekonstruktion des Beckens aus 2D-Projektionsbildern*

Lamecker H., Wenkebach T.H., Hege H.-C., Duda G.N., **Heller M.O.**  
Bildverarbeitung in der Medizin, Hamburg, 2005

*Die medio-laterale Kraftverteilung im Schafsknie*

Taylor W.R, König C., Speirs A.D., Ehrig R.M., Duda G.N., **Heller M.O.**  
Deutscher Kongress für Unfallchirurgie und Orthopädie Berlin, 2006

## 2005

*Optimising joint loading by pre-operative musculoskeletal analysis of total hip replacements*

**Heller, M.O.**, Schröder J. Taylor W.R., Sharenkov A, Wulsch P., Perka C., Duda G.N.

Proceedings of the 7th EFORT Congress, Lisboa, 2005

*Tibiofemoral joint contact forces during walking and stair climbing activities*

Taylor W.R., **Heller M.O.**, Bergmann G., Duda G.N.

Proceedings of the 7th EFORT Congress, Lisboa, 2005

*Ein neues Modell zur Beschreibung der in vivo Kniekinematik: Validierung an 12 Probanden*

**Heller M.O.**, Duda G.N., König C., Taylor W.R., Ehrig R., Hinterwimmer S., Graichen H.

1. Gemeinsamer Kongress Orthopädie und Unfallchirurgie Berlin, 2005

*Tibio-femoral Loading During Normal Daily Activities*

Taylor W.R., **Heller M.O.**, Bergmann G., Duda G.N.

Proceedings of the IMechE Symposium: Knee Arthroplasty: Engineering Functionality. The Royal College of Surgeons, London, UK, 2005

*Validation of a new model of human knee kinematics against in vivo data under physiological neuromuscular activation patterns*

**Heller M.O.**, Duda G.N., König C., Taylor W.R., Ehrig R., Hinterwimmer S.; Graichen H.

Transactions Orthop Res Soc Vol. 30, Washington, D.C., 2005

*Animal models for knee injury frequently underestimate the mechanical conditions of the clinical situation*

Taylor W.R., Ehrig R.M., **Heller M.O.**, Schell H., Seebeck P., Duda G.N.

Transactions Orthop Res Soc Vol. 30, Washington, D.C., 2005

*Validation of a new model of human knee kinematics against in vivo data in 12 subjects*

**Heller M.O.**, Duda G.N., König C., Taylor W.R., Ehrig R., Hinterwimmer S., Graichen H.

Proceedings Biomechanica, Hamburg, 2005

**2004**

*On the influence of mechanical conditions on tissue differentiation in osteochondral defect healing*

Duda G.N, Maldonado Z., Seebeck P., **Heller M.O.**, Thompson M.S.

Proceedings of the 14<sup>th</sup> ESB Conference, s'Hertogenbosch, The Netherlands, 2004

*Tibio-femoral loading during human gait and stair-climbing*

Taylor W.R., **Heller M.O.**, Bergmann G., Duda G.N.

Proceedings of the 14<sup>th</sup> ESB Conference, s'Hertogenbosch, The Netherlands, 2004

*The influence of frontal plane alignment on knee joint loading: implications for high tibial osteotomies*

**Heller M.O.**, Taylor W.R., Perka C., Duda G.N.

Proceedings of the 14<sup>th</sup> ESB Conference, s'Hertogenbosch, The Netherlands, 2004

*Hip joint loading after total hip replacement: the influence of cup position and patient activity*

**Heller M.O.**, Sharenkov A., Taylor W.R., Kassi J.-P., Perka C., Duda G.N.

Proceedings of the 14<sup>th</sup> ESB Conference, s'Hertogenbosch, The Netherlands, 2004

*Ein neues Therapieplanungstool zur Optimierung der Belastungen an der Hüfte*

**Heller M.**, Taylor W., Sharenkov A., Schröder J., Wulsch P., Perka C., Duda G.

90. Tagung der Deutschen Gesellschaft für Orthopädie und Orthopädische Chirurgie, Berlin, 2004

*Die Bedeutung der Lage des Gelenkzentrums für die Hüftbelastungen: Welche biomechanischen Konsequenzen ergeben sich aus einem hohen Hüftzentrum?*

**Heller M.**, Taylor W., Kassi J.-P., Sharenkov A., Perka C., Duda G.

90. Tagung der Deutschen Gesellschaft für Orthopädie und Orthopädische Chirurgie, Berlin, 2004

*Load optimized therapy planning in THA*

**Heller M.O.**, Taylor W.R., Sharenkov A., Schröder J., Wulsch P., Perka C., Duda G.N.

Proceedings of the 4<sup>th</sup> Meeting of CAOS International, Chicago, USA

*Musculoskeletal analyses for load optimized therapy planning in THA*

**Heller M.O.**, Schröder J., Taylor W.R., Sharenkov A., Wulsch P., Perka C., Duda G.N.

Proceedings of the EORS 2004, Amsterdam

## 2003

*Der Einfluss einer Achsfehlstellung auf die muskuloskelettalen Belastungen am Knie*

**Heller M.O.**, Taylor W.R., Perka C., Haas N.P., Duda G.N.

89. Tagung der Deutschen Gesellschaft für Orthopädie und Orthopädische Chirurgie, Berlin, 2003

*Die langfristige periprothetische Knochenmineraldichte wird durch den operativen Zugang definiert*

**Heller M.O.**, Duda G.N., Wilke K., Haas N.P., Zippel H., Perka C.

89. Tagung der Deutschen Gesellschaft für Orthopädie und Orthopädische Chirurgie, Berlin, 2003

*Surgical approach in total hip arthroplasty causes long term differences in perprosthetic femoral bone densities*

**Heller M.O.**, Perka C., Wilke K., Haas N.P., Zippel H., Duda G.N.

Transactions Orthop Res Soc Vol. 28, New Orleans, Louisiana, 2003

*Tibio-femoral loading during the human gait cycle*

Taylor W.R., **Heller M.O.**, Bergmann G., Duda G.N.

Transactions Orthop Res Soc Vol. 28, New Orleans, Louisiana, 2003

*Towards integrating musculo-skeletal analysis into pre-operative planning – The influence of axial alignment on individual knee joint loading*

**Heller M.O.**, Taylor W.R., Leonhardt U., Perka C., Duda G.N.

Proceedings of the 3<sup>rd</sup> Meeting of CAOS International, Marbella, Spain

## 2002

*Muscle Activity is Essential for a Realistic Pre-clinical Evaluation of Primary Stability in THA. ESB S.M. Perren Award*

Kassi J.-P., **Heller M.O.W.**, Stoeckle U., Perka C., Duda G. N.

Proceedings of the 13<sup>th</sup> ESB Conference Wroclaw, Poland, 2002

*Bone straining of the intact and fractured proximal humerus under physiological loading*

Maldonado Z., Seebeck J., **Heller M.**, Brandt D., Hepp P., Lill H., Duda G. N.

Proceedings of the 13<sup>th</sup> ESB Conference Wroclaw, Poland, 2002

*Mechanical Conditions are Essential for Osteochondral Defect Healing*

Duda G.N., Bail H., Klein P., Malaye F.T., **Heller M.O.**, Haas N.P.

Proceedings of the 13<sup>th</sup> ESB Conference Wroclaw, Poland, 2002

*Influence of bone quality and screw placement on the load transfer between an internal fixator and the proximal tibia*

Seebeck J., **Heller M.**, Duda G., Schneider E.

Osteoporosis International 13: 7 Suppl 2 S3, ISFR Bologna, 2002

*Lateralization and anteversion influence femoral straining and cement mantle stressing in total hip arthroplasty*

Kleemann R., **Heller M.O.W.**, Taylor W.R., Duda G.N.

Transactions Orthop Res Soc Vol. 27, Dallas, Texas, 2002

## 2001

*Sufficient stiffness makes gap movement independent of external fixator mounting*

Klein P., Schell H., **Heller M.**, Kassi J., Streitparth F., Opitz M., Kandziora F.,

Pohl M., Haas N., Claes L., Duda G. N.

Transactions Orthop Res Soc Vol. 26, San Francisco, California, 2001

*Einfluß der Prothesengeometrie und Implantation auf die Hüftbelastung nach TEP*

**Heller M.**, Bergmann G., Deuretzbacher G., Haas N.P., Claes L., Duda G.N.

Tagungsband 2. Tagung der Deutschen Gesellschaft für Biomechanik, Freiburg, 2001

## 2000

*Clinical Biomechanics Award: Influence of femoral anteversion on proximal femoral loading: measurement and simulation in 4 patients*

**Heller M.**, G. Bergmann, Deuretzbacher G., Claes L., Haas N.P., Duda G.N.

Proceedings of the ESB 12<sup>th</sup> Conference Dublin, Ireland, 2000

*Hip contact and proximal femoral loading increases with anteversion: measurements and simulations in 4 patients*

**Heller M.**, Bergmann G., Deuretzbacher G., Duda G. N.

Transactions Orthop Res Soc, Vol. 25, Orlando, Florida, 2000

*Proximal femoral loading increases with anteversion: measurements and simulation in 4 patients*

**Heller M.**, Bergmann G., Deuretzbacher G., Claes L., Duda G.N.

Trans EORS, Vol 10, Wiesbaden 2000

*Prä-operative Planung und Optimierung der mechanischen Beanspruchungen bei Gelenkersatz und Umstellungsosteotomie*

**Heller M.**, Bergmann G., Deuretzbacher G., Claes L., Haas N.P., Duda G.N.

64. Jahrestagung der Deutschen Gesellschaft für Unfallchirurgie, Hannover

## 1999

*Mechanische Rahmenbedingungen der Frakturheilung. Grenzindikationen für die Versorgung mit dem unaufgebohrten Tibiamarknagel*

**Heller M.**, Mandruzzato F., Goldhahn J., Hehli M., Moser R., Duda G.N.

H z d Unfallchirurg 275 467 1999

*Importance of muscle forces on the loading of fractured tibia after unreamed nailing*

**Heller M.**, Mandruzzato F., Hehli M., Claes L., Haas N.P. and Duda G.N.

Trans EORS Brussels, 1999

*Femorale Beanspruchungen unter komplexer Muskelbelastung*

**Heller M.**, Mandruzzato F., Hoffmann JE, Haas NP, Claes L, Duda GN

Tagungsband 1. Tagung der Deutschen Gesellschaft für Biomechanik, Ulm, 1999

*A validated simulation model to predict proximal femoral loading during walking and stair climbing*

**Heller M.**, Bergmann G., Deuretzbacher G., Claes L., Duda G.N.

Biomechanics meets Robotics, Heidelberg, 1999

## 1998

*Femoral strain distribution under complex thigh muscle loading during gait*

**Heller, M.**, Duda, G., Claes L.

J Biomech, 31: Suppl 1, 147, 1998

## Patents

### **Patent family DE10331110**

Simulation method for musculo-skeletal loading of patient for use in surgical intervention and/or rehabilitation using individual musculo-skeletal parameters for determination of musculo-skeletal strains

(Verfahren zur Simulation muskulo-skelettaler Belastungen eines Patienten)

Inventors: **Heller M.O.**, Duda G.N., Taylor W.R.

Derived international applications:

- EP 1618511
- US 2006287612

### **Patent family DE102004006501**

Component and method for assembling an implant arrangement

(Bauteil und Verfahren zum Zusammenbau einer Implantatanordnung)

Inventors: Duda G.N., **Heller M.O.**

Derived international applications:

- EP 1744686
- US 20080154265

### **Patent family DE102007031946**

Method for detecting information relevant for the characterization of joint movements

(Verfahren zum Ermitteln von für die Charakterisierung von Gelenkbewegungen relevanten Informationen)

Inventors: **Heller M.O.**, Ehrig. R., Taylor W.R., Duda G.N.

Derived international applications:

- EP 2008058729
- US 20110054851

### **Patent family DE102008023218**

Method and apparatus for examining a body with an ultrasound head

(Verfahren und Vorrichtung zur Untersuchung eines Körpers mit einem Ultraschallkopf)

Inventors: Kammerzell S., **Heller M.O.**, Sharenkov S., König. C.

Derived international application:

- US 20090281428