

Wissenschaftliche Veröffentlichungen (referierte Artikel, Buchartikel **B**)

1983 - 1989

1. **Hausmann M** (1983) Experimenteller Aufbau zur Untersuchung von Atomen und Ionen in superflüssigem Helium, insbesondere Messungen an der Atom- und Ionenquelle. Diplomarbeit, Physikalisches Institut der Universität Heidelberg
2. Bauer H, **Hausmann M**, Mayer R, Reyher HJ, Weber E, Winnacker A (1985) Implementation of impurity ions into He II for optical spectroscopy purposes. Phys. Lett. 110 A: 279 – 282
3. **B** Loos P, Cremer T, **Hausmann M**, Jauch A, Emmerich P, Schlegel W, Cremer C (1987) Distances between two chromosomes in interphase nuclei as determined with digital image analysis. In: Clinical Cytometry and Histometry (Hrg.: Burger G, Ploem JS, Goerttler K), Academic Press, London: 285 – 287
4. Dudin G, Cremer T, Schardin M, **Hausmann M**, Bier F, Cremer C (1987) A method for nucleic acid hybridization to isolated chromosomes in suspension. Hum. Genet. 76: 290 – 292
5. Dudin G, **Hausmann M**, Rens W, Aten J, Cremer C (1987) Fluorescence hybridization to isolated metaphase chromosomes in suspension for flow cytometric analysis. Annales Universitatis Saravensis Medicinae Suppl. 7/1987: 81 – 84
6. Blochmann U, Dudin G, **Hausmann M**, Bühring HJ, Cremer T, Cremer C (1987) In situ hybridization of chromosomes with biotinylated DNA after 1g-sedimentation. Ann. Univ. Sarav. Med. Suppl. 7/1987: 32 – 35
7. **Hausmann M** (1988) Laserfluoreszenzaktivierte Analyse und Sortierung von Metaphase-chromosomen. Anwendung der Slit-Scan Flussphotometrie. Dissertation, Fakultät für Physik und Astronomie, Universität Heidelberg
8. Cremer C, **Hausmann M**, Zuse P, Aten JA, Barths J, Bühring H-J (1989) Flow cytometry of chromosomes: Principles and applications in medicine and molecular biology. Optik 82: 9 – 18
9. Cremer C, Dölle J, **Hausmann M**, Bier FF, Rohwer P (1989) Laser in cytometry: Applications in flow cytogenetics. Ber. Bunsenges. Chem. 93: 327 – 335
10. Noethe S., Männer R, **Hausmann M**, Horner H, Cremer C (1989) Classification of normal and aberrant chromosomes by an optical neural network in flow cytometry. In: Optical Computing, Technical Digest Series 9: 14-17.
11. **B** Cremer C, **Hausmann M**, Diaz E, Hetzel J, Aten JA, Cremer T (1989) Chromosome aberration detection with hybridized DNA probes: Digital image analysis and slit scan flow cytometry. In: Automation of Cytogenetics (Hrg.: Lundsteen C, Piper J) Springer Verlag, Berlin, Heidelberg, New York: 123 – 132
12. Bier FF, Bettag U, Rheingans T, Adrian H, Barths J, **Hausmann M**, Dudin G, Bühring H-J, Rohwer P, Dölle J, Cremer C (1989) Determination of the electrophoretic mobility of chromosomes by free flow electrophoresis. I. Morphology and stability. Electrophoresis 10: 690 – 697

1990 - 1992

13. Zuse P, Hauser R, Männer R, **Hausmann M**, Cremer C (1990) Real-time classification of chromosomes in slit-scan flow cytometry using NERV – a MIMD supercomputer. In: Rishe N, Navathe S, Tal D (eds.) Proc. PARBASE '90 (IEEE Computer Society), 7.3. – 16.3.1990, Miami Beach, USA: 564
14. Popp S, Remm B, **Hausmann M**, Lührs H, van Kaick G, Cremer T, Cremer C (1990) Towards a cumulative biological dosimeter based on chromosome painting and digital image analysis. Kerntechnik 55: 204 – 210
15. **B** **Hausmann M**, Zuse P, Aten JA, Rens W, Männer R, Cremer C (1990) High speed analysis of slit scan profiles of normal and aberrant metaphase chromosomes. In: Advances in Analytical Cellular Pathology (Hrg.: Burger G, Oberholzer M, Vooijs GP) Elsevier Science Publ., Amsterdam: 67 – 68
16. Zuse P, Hauser R, Männer R, **Hausmann M**, Cremer C (1990) Real-time multiprocessing of slit scan chromosome profiles. Comput. Biol. Med. 20: 465 – 476

17. Dölle J, **Hausmann M**, Cremer C (1990) Background and peak evaluation of one parameter flow karyotypes. *Analyt. Cell. Path.* 3: 119 – 132
18. Hartig R, Weber G, **Hausmann M**, Cremer C, Bier F, Bettag U (1991) Vorrichtung zur Trennung von an magnetischen Partikeln (Beads) gebundenem biologischem Material in einem Magnetfeld. Offenlegungsschrift DE 3925093 A1, Deutsches Patentamt München (Offenlegungstag 31. 1. 1991)
19. Geiger B, Komitowski D, Jauch A, **Hausmann M**, Cremer T, Cremer C (1991) Optical sectioning and 3d-image reconstruction to determine the volumes of specific chromosome regions in human interphase cell nuclei. *Optik* 86: 113 – 119
20. **Hausmann M**, Dudin G, Aten JA, Heilig R, Diaz E, Cremer C (1991) Slit scan flow cytometry of isolated chromosomes following fluorescence hybridization: An approach of online screening for specific chromosomes and translocation chromosomes. *Z. Naturforsch.* 46c: 433 – 441.
21. Schweppe F, **Hausmann M**, Hexel K, Barths J, Cremer C (1992) An adapter for defined sample volumes makes it possible to count absolute particle numbers in flow cytometry. *Analyt. Cell. Path.* 4: 325 – 334.
22. Bradl J, **Hausmann M**, Ehemann V, Komitowski D, Cremer C (1992) A tilting device for three-dimensional microscopy: application to in situ imaging of interphase cell nuclei. *J. Microsc.* 168: 47 – 57.
23. **Hausmann M**, Dölle J, Arnold A, Stepanow B, Wickert B, Boscher J, Popescu CP, Cremer C (1992) Development of a two parameter slit-scan flow cytometer for screening of normal and aberrant chromosomes: Application to a karyotype of *Sus scrofa domestica* (pig). *Opt. Eng.* 31: 1463 – 1469.
24. Dölle J, **Hausmann M**, Cremer C (1992) „Nimmt in kurzer Folge Signale auf“. VMEbus Rechner in der Chromosomenanalyse. *VMEbus* 6/4: 76 – 79.
25. **B** Cremer C, **Hausmann M**, Popp S, Cremer T (1992) Methods for automated cytogenetic analysis of radiation damage in metaphase chromosomes. In: *Medizinische Physik 1992* (Hrg.: Roth J) Tagungsband, Basel, ISBN 3-9081-11-1 (SGSMP), ISBN 3-9081-09-2 (DGMB): 31 – 35.
26. Hartig R, **Hausmann M**, Schmitt J, Herrmann D, Riedmiller M, Cremer C (1992) Preparative continuous separation of biological particles by means of free-flow-magnetophoresis based on a free-flow-electrophoresis chamber. *Electrophoresis* 13: 674-676.

1993 - 1995

27. Heilig R, **Hausmann M**, Rens W, Aten JA, Cremer C (1993) Time optimized analysis of slit scan chromosome profiles on a general purpose personal computer. *CABIOS* (Computer Applications in the Biosciences) 9: 381 – 385.
28. **Hausmann M**, Popescu CP, Boscher J, Kerboeuf D, Dölle J, Cremer C (1993) Identification and cytogenetic analysis of an abnormal pig chromosome for flow cytometry and sorting. *Z. Naturforsch.* 48c: 645 – 653
29. **B** Cremer C, **Hausmann M**, Popp S, Cremer T (1993) Analyse von Strahlenschäden in menschlichen Metaphasechromosomen nach Fluoreszenz in situ Hybridisierung. In: *Zytogenetische Methoden* (Hrsg.: Arndt D, Obe G) BGA-Schriften 3/93, MMV Medizin Verlag, München (ISBN 3-8208-1227-X): 27 – 32
30. Celeda D, Aldinger K, Haar F-M, **Hausmann M**, Durm M, Ludwig H, Cremer C (1994) Rapid fluorescence in situ hybridization with repetitive DNA probes: Quantification by digital image analysis. *Cytometry* 17: 13 – 25
31. Haar F-M, Durm M, Aldinger K, Celeda D, **Hausmann M**, Ludwig H, Cremer C (1994) A rapid FISH technique for quantitative microscopy. *Biotechniques* 17: 346 – 353
32. Bradl J, **Hausmann M**, Schneider B, Rinke B, Cremer C (1994) A versatile  $2\pi$ -tilting device for fluorescence microscopes. *J. Microsc.* 176: 211 – 221
33. Cremer C, Aldinger K, Popp S, **Hausmann M** (1995) Erkennung strahleninduzierter Chromosomenaberrationen mittels Fluoreszenzhybridisierung und Bildanalyse. *Z. Med. Phys.* 5: 9 – 18

34. Rinke B, Bischoff A, Meffert M-C, Scharschmidt R, **Hausmann M**, Stelzer EHK, Cremer T, Cremer C (1995) Volume ratios of painted chromosome territories 5, 7, and X in female human cell nuclei studied with laser confocal microscopy and the Cavalieri estimator. *Bioimaging* 3: 1 – 11
35. Hartig R, **Hausmann M**, Cremer C (1995) Continuous focusing of biological particles by continuous immuno magnetic sorter: Technique and applications. *Electrophoresis* 16: 789 – 792
36. Hartig R, **Hausmann M**, Weber G, Cremer C (1995) Continuous sorting of magnetizable particles by means of specific deviation. *Rev. Sci. Instr.* 66: 3289 – 3295
37. Cremer C, Cremer T, Popp S, Durm M, **Hausmann M** (1995) Moderne Chromosomentests zur schnellen Detektion von Aberrationen in der biologischen Dosimetrie. *Dt. Ärzteblatt* 92: A – 1922 – 1928
38. **Hausmann M**, Dölle J, Schurwanz M, Cremer C (1995) Slit-scan flow fluorometry and sorting of chromosomes: a fast preanalysis system for microscopy. *Eur. Microsc. Anal.* 36 (7/1995) : 27 – 29
39. **Hausmann M**, Durm M, Haar F-M, Sorokine-Durm I, Dölle J, Popp S, Voisin P, Cremer T, Cremer C (1995) New approaches for radiation induced chromosome aberration detection: chromosome painting, Fast FISH, image microscopy, and slit-scan flow fluorometry. In: *Proceedings of the 2<sup>nd</sup> Symposium on "Radiation Biology and its Application in Space Research"* (Hrg.: Kozubek S, Horneck G), Kiramo 1995: 231 – 240
40. Kraus M, **Hausmann M**, Hartig R, Durm M, Haar F-M, Cremer C (1995) Non-enzymatic, low temperature in situ hybridization of metaphase chromosomes for magnetic labelling and sorting. *Exp. Techn. Phys.* 41: 139 – 153

1996

41. Bradl J, Rinke B, Schneider B, **Hausmann M**, Cremer C (1996) Improved resolution in "practical" light microscopy by means of a glass fibre  $2\pi$ -tilting device. In: *Optical and Imaging Techniques for Biomonitoring* (Hrg.: Foth H-J, Marchesini R, Podbielska H, Robert-Nicaud M, Schneckenburger H) *Proc. SPIE* 2628: 140 – 146
42. **Hausmann M**, Wickert B, Vogel M, Schurwanz M, Dölle J, Wolf D, Aldinger K, Cremer C (1996) Optics and experimental resolution of the Heidelberg slit-scan flow fluorometer. In: *Biomedical Optoelectronics in Clinical Chemistry and Biotechnology* (Hrg.: Anderson-Engels S, Corti M, Kroò N, Kertész I, King TA, Pratesi R, Seeger S, Weber HP) *Proc. SPIE* 2629: 146 – 156
43. Durm M, Haar F-M, **Hausmann M**, Ludwig H, Cremer C (1996) Optimization of fast-fluorescence in situ hybridization with repetitive  $\alpha$ -satellite probes. *Z. Naturforsch.* 51c: 253 – 261
44. Bornfleth H, Aldinger K, **Hausmann M**, Jauch A, Cremer C (1996) Comparative genomic hybridization imaging by the one chip true-color CCD camera Kappa CF 15 MC. *Cytometry* 24: 1 – 13
45. **Hausmann M**, Dölle J, Cremer C (1996) Slit-Scan Durchflußzytometrie von Chromosomen-aberrationen: Perspektiven in der biologischen Dosimetrie. *Z. Med. Phys.* 6: 59 – 67
46. Durm M, **Hausmann M**, Aldinger K, Ludwig H, Cremer C (1996) Painting of human chromosome 8 in fifteen minutes. *Z. Naturforsch.* 51c: 435 – 439
47. Rinke B, Bradl J, Schneider B, Durm M, **Hausmann M**, Ludwig H, Cremer C (1996) "in situ" estimates of the spatial resolution for "practical" fluorescence microscopy of cell nuclei. In: *Fluorescence Microscopy and Fluorescent Probes* (Hrg.: Slavik J) Plenum Press, New York Washington Boston: 169 – 173
48. Haar F-M, Durm M, **Hausmann M**, Ludwig H, Cremer C (1996) Optimization of Fast-FISH for  $\alpha$ -satellite DNA probes. *J. Biochem. Biophys. Methods*: 33: 43 – 54
49. **Hausmann M** (1996) Entwicklungen zur Slit-Scan Flußfluorometrie zur laserfluoreszenzaktivierten Analyse und Sortierung von Mikropartikeln (Chromosomen).

Habilitationsschrift zur Erlangung der *venia legendi* für das Fach Physik, Fakultät für Physik und Astronomie, Universität Heidelberg

50. **B** Durm M, Sorokine-Durm I, Haar F-M, Münch H, **Hausmann M**, Ludwig H, Voisin P, Cremer C (1996) Schnelle simultane FISH-Markierung von Zentromeren für die automatische Bildanalyse. In: Strahlenschutz und Strahlenbiologie – Moderne Entwicklungen und Tendenzen in der Strahlenbiologie (Hrg.: Heinemann G, Pfof H) Verlag TÜV Rheinland, Köln: 177 – 181
51. **B Hausmann M**, Lentfer H, Wolf D, Crone M, Aldinger K, Cremer C (1996) Slit-Scan Flußfluorometrie zur schnellen Vorsortierung aberranter Chromosomen in der biologischen Dosimetrie. In: Strahlenschutz und Strahlenbiologie – Moderne Entwicklungen und Tendenzen in der Strahlenbiologie (Hrg.: Heinemann G, Pfof H) Verlag TÜV Rheinland, Köln: 155 – 159
52. Papastravrou G, Rinke B, **Hausmann M**, Cremer C (1996) Scanning force microscopical examination of metaphase chromosomes after in situ hybridization. In: Optical Biopsies and Microscopic Techniques (Hrg.: Bigio IJ, Grundfest WS, Schneckenburger H, Svanberg K, Viallet PM) Proc. SPIE 2926: 308 – 315
53. **Hausmann M**, Crone M, Cremer C (1996) Depth of field and improved resolution of slit-scan flow systems. In: Optical Biopsies and Microscopic Techniques (Hrg.: Bigio IJ, Grundfest WS, Schneckenburger H, Svanberg K, Viallet PM) Proc. SPIE 2926: 297 – 307
54. Rinke B, Bradl J, Edelmann P, Schneider B, **Hausmann M**, Cremer C (1996) Image acquisition and calibration methods in quantitative confocal laser scanning microscopy. In: Optical Biopsies and Microscopic Techniques (Hrg.: Bigio IJ, Grundfest WS, Schneckenburger H, Svanberg K, Viallet PM) Proc. SPIE 2926: 190 – 200
55. Bradl J, Rinke B, Esa A, Edelmann P, Krieger H, Schneider B, **Hausmann M**, Cremer C (1996) Comparative study of three-dimensional localization accuracy in conventional, confocal laser scanning and axial tomographic fluorescence light microscopy. In: Optical Biopsies and Microscopic Techniques (Hrg.: Bigio IJ, Grundfest WS, Schneckenburger H, Svanberg K, Viallet PM) Proc. SPIE 2926: 201 – 206
56. Bradl J, Rinke B, Schneider B, Edelmann P, Krieger H, **Hausmann M**, Cremer C (1996) Resolution improvement in 3D fluorescence microscopy by object tilting. Eur. Microsc. Anal. 44 (11/1996) : 9 – 11

1997 - 1998

57. Durm M, Haar F-M, **Hausmann M**, Ludwig H, Cremer C (1997) Non-enzymatic, low temperature fluorescence in situ hybridization of human chromosomes with a repetitive  $\alpha$ -satellite probe. Z. Naturforsch. 52c: 82 – 88
58. Durm M, Haar F-M, **Hausmann M**, Ludwig H, Cremer C (1997) Optimized Fast-FISH with  $\alpha$ -satellite probes: Acceleration by microwave activation. Braz. J. Med. Biol. Res. 30: 15 – 23
59. Bradl J, Nagorni M, Schneider B, **Hausmann M**, Cremer C (1997) Microscope control, image acquisition and visualization in a network environment: towards "online" telemicroscopy. Cell Vision 4: 241 – 242
60. **B Hausmann M**, Hartig R, Liebich H-G, Lüers G, Saalmüller A, Teichmann R, Cremer C (1997) Free-flow magnetophoresis: Continuous immuno magnetic sorting of cells and organelles by magnetic deviation and focussing. In: Cell Separation: Methods and Applications (Hrg.: Recktenwald D, Radbruch A) Marcel Dekker, New York: chapter 10, 209 – 235
61. Cremer C, Bornfleth H, Bradl J, Esa A, Kreth G, Rinke B, Eils R, Münkel C, Dietzel S, Granzow M, Jauch A, Guan X-Y, Meltzer PS, Trent JM, Trakhtenbrot L, Zink D, Langowski J, **Hausmann M**, Cremer T (1997) Nuclear architecture and the formation of chromosome aberrations. Radiat. Res. 148: 513 – 515

62. Durm M, Sorokine-Durm I, Haar F-M, **Hausmann M**, Ludwig H, Voisin P, Cremer C (1998) Fast-FISH technique for rapid, simultaneous labelling of all human centromeres. *Cytometry* 31: 153 – 162
63. **Hausmann M**, Schneider B, Bradl J, Cremer C (1998) High-precision microscopy of 3D-nanostructures by a spatially modulated excitation fluorescence microscope. *Proc. SPIE* 3197: 217 – 222
64. **Hausmann M**, Lentfer H, Wolf D, Bauer E, Aldinger K, Greulich K-O, Cremer C (1998) Biological dosimetry after H<sub>2</sub>O<sub>2</sub>/L-Histidine treatment. *Proc. SPIE* 3199: 183 – 190
65. **B** Schneider B, Bradl J, Kirsten I, **Hausmann M**, Cremer C (1998) High precision localization of fluorescent targets in the nanometer range by spatially modulated excitation fluorescence microscopy. In: *Fluorescence Microscopy and Fluorescent Probes (Vol. 2)* (Hrg.: Slavik J) Plenum Press, New York Washington Boston: 71 – 76
66. **B** Sorokine-Durm I, Durm M, Durand V, Haar F-M, **Hausmann M**, Cremer C, Voisin P (1998) Biological dosimetry using the Fast-FISH technique for rapid labelling of all human centromeres. In: *Fluorescence Microscopy and Fluorescent Probes (Vol. 2)* (Hrg.: Slavik J) Plenum Press, New York Washington Boston: 171 – 176
67. Durm M, Schüssler L, Münch H, Craig J, Ludwig H, **Hausmann M**, Cremer C (1998) Fast-painting of human metaphase spreads using a chromosome specific repeat depleted DNA library probe. *Biotechniques* 24 : 820 – 825 (incl. Cover-page)
68. **B Hausmann M**, Cremer C (1998) Application de la cytométrie en flux et de type « slit-scan » à l'analyse et au tri des chromosomes de mammifères. In : *Techniques de Cytogénétique Animal* (Hrg. : Popescu P, Hayes H, Dutrillaux B) INRA edition, Paris, ISBN 2-7380-0819-4, ISSN 1150-3912 : 173 – 193
69. Esa A, Trakhtenbrot L, **Hausmann M**, Rauch J, Brok-Simoni F, Rechavi G, Ben-Bassat I, Cremer C (1998) Fast-FISH detection and automated image analysis of numerical chromosome aberrations in hematological malignancies. *Analyt. Cell. Pathol.* 16: 211 – 222
70. Luers GH, Hartig R, Mohr H, **Hausmann M**, Fahimi HD, Cremer C, Völkl A (1998) Immuno-isolation of highly purified peroxisomes using magneticbeads and continuous immunomagnetic sorting. *Electrophoresis* 19: 1205 – 1210
71. Cremer C, **Hausmann M**, Bradl J, Rinke B (1998) Verfahren und Vorrichtung zur Distanzmessung zwischen Objektstrukturen. Internationale Offenlegung (PCT) WO 98/28592 (Offenlegungstag 2.7.1998)
72. Cremer C, **Hausmann M**, Cremer T (1998) Markierung von Nukleinsäuren mit speziellen Probengemischen. Offenlegungsschrift DE 198 06 962 A1, Deutsches Patentamt München (Offenlegungstag 1.10.1998)
73. **B** Cremer C, Rauch J, Edelmann P, Bornfleth H, Schneider B, Upmann I, Bradl J, Dietzel S, Solovei I, Knoch TA, Langowski J, Cremer T, **Hausmann M** (1998) Spectral precision distance measurements by confocal laser scanning and SME-microscopy for 3D genome analysis. In: Maurer J (Hsg.) *Progress Report 1996 – 1998 German Human Genome Project*, ISBN 3-00-003810-8, Berlin: 91 – 95

1999 - 2001

74. **B Hausmann M**, Esa A, Edelmann P, Trakhtenbrot L, Bornfleth H, Schneider B, Bradl J, Ben-Bassat I, Rechavi G, Cremer C (1999) Advanced precision light microscopy for the analysis of 3d-nanostructures of chromatin breakpoint regions: Towards a structure-function relationship of the *bcr-abl* region. In: *Fundamentals for the Assessment of Risks from Environmental Radiation* (Hrg.: Baumstark-Khan C, Kozubek S, Horneck G) NATO-ASI Series, Vol. 55, Kluwer Academic Publishers, Dordrecht: 219 – 230
75. Schneider B, Upmann I, Kirsten I, Bradl J, **Hausmann M**, Cremer C (1999) A dual-laser, spatially modulated illumination fluorescence microscope. *Eur. Microsc. Anal.* 57 (1/1999) : 5 – 7
76. **Hausmann M**, Cremer C, Bradl J, Schneider B (1999) Wellenfeldmikroskop, Wellenfeld-mikroskopieverfahren, auch zur Dann-Sequenzierung, und

- Kalibrierverfahren für die Wellenfeldmikroskopie. Offenlegungsschrift DE 198 30 596 A1, Deutsches Patentamt München (Offenlegungstag 14.1.1999)
77. Edelmann P, Esa A, Bornfleth H, Heintzmann R, **Hausmann M**, Cremer C (1999) Correlation of chromatic shifts and focal depth in spectral precision distance microscopy measured by micro-axial tomography. Proc. SPIE 3568: 89 – 95
  78. Cremer C, Edelmann P, Esa A, Bornfleth H, Schneider B, Bradl J, Rinke B, Trakhtenbrot L, Dietzel S, **Hausmann M**, Cremer T (1999) Spektrale Präzisionsdistanzmikroskopie in der Genomforschung. Z. Med. Phys. 9: 14 – 20
  79. Edelmann P, Esa A, **Hausmann M**, Cremer C (1999) Confocal laser-scanning fluorescence microscopy: In situ determination of the confocal point-spread function and the chromatic shifts in intact cell nuclei. Optik 110: 194 – 198
  80. **B** Cremer C, Edelmann P, Bornfleth H, Kreth G, Münch H, Luz H, **Hausmann M** (1999) Principles of spectral precision distance microscopy for the analysis of molecular nuclear structure. In: Handbook of Computer Vision and Applications, Vol. 3, Systems and Applications (Hrg.: Jähne B, Haußecker H, Geißler P) Academic Press, San Diego: 839 – 857
  81. Wolf D, Rauch J, **Hausmann M**, Cremer C (1999) Comparison of the thermal denaturation behaviour of DNA-solutions and chromosome preparations in suspension. Biophys. Chem. 81: 207 – 221
  82. **B** Bártová E, Kozubek S, Durm M, **Hausmann M**, Kozubek M, Lukášová E, Skalníková M, Jirsová P, Cafourková A, Buchníčková K (1999) The position of centromeres in the interphase nuclei of human leukemic cells during myeloid differentiation and after gamma-irradiation. In: Fluorescence Microscopy and Fluorescent Probes (Vol. 3) (Hrg. Kotyk A) Espero Publishing, Ústí nad Labem (CZ), ISBN 80-238-4668-X: 347 – 354
  83. Rauch J, **Hausmann M**, Bornfleth H, Solovei I, Cremer T, Cremer C (2000) Application of 3D Spectral Precision Distance Microscopy to a supramolecular marker cluster on chromosome 15. Proc. QMC (1<sup>st</sup> Euroconf. Quant. Molec. Cytogenet., 13.4. – 15.4.2000, Bari, Italien) : 101 – 106
  84. Rauch J, Wolf D, Craig JM, **Hausmann M**, Cremer C (2000) Quantitative microscopy after fluorescence in situ hybridization – a comparison between repeat-depleted and non-depleted DNA probes. J. Biochem. Biophys. Methods 44: 59 – 72
  85. Esa A, Edelmann P, Kreth G, Trakhtenbrot L, Amariglio N, Rechavi G, **Hausmann M**, Cremer C (2000) Three-dimensional spectral precision distance microscopy of chromatin nano-structures after triple-colour DNA labelling: a study of the BCR region on chromosome 22 and the Philadelphia chromosome. J. Microsc. 199: 96 – 105
  86. **B** **Hausmann M**, Cremer C (2000) Application of flow cytometry and slit-scan flow cytometry in analysis and sorting of mammalian chromosomes. In: Techniques in Animal Cytogenetics (Hrg.: Popescu P, Hayes H, Dutrillaux B) Series “Principles and Practice” Springer-Verlag, Berlin, Heidelberg, New York, ISBN 3-540-66737-7: 157 – 176
  87. **B** **Hausmann M**, Esa A, Edelmann P, Trakhtenbrot L, Amariglio N, Rechavi G, Cremer C (2000) Einblicke in die dreidimensionale Architektur des Zellkerns. In: “Strahlenbiologie und Strahlenschutz – Individuelle Strahlenempfindlichkeit und ihre Bedeutung für den Strahlenschutz” (Hrg.: Heinemann G, Müller W.-U.) Band I, TÜV-Verlag, Köln, (ISBN 3-8249-0618-X, ISSN 1013-4506): 87 – 104
  88. **B** Rapp A, **Hausmann M**, Pool-Zobel B, Greulich KO (2000) COMET-Assay und COMET-FISH zur Detektion individueller Strahlen- und Toxinempfindlichkeit von Genom-Abschnitten. In: “Strahlenbiologie und Strahlenschutz – Individuelle Strahlenempfindlichkeit und ihre Bedeutung für den Strahlenschutz” (Hrg.: Heinemann G, Müller W.-U.) Band I, TÜV-Verlag, Köln, (ISBN 3-8249-0618-X, ISSN 1013-4506): 114 – 131
  89. Rauch J, Wolf D, **Hausmann M**, Cremer C (2000) The influence of formamide on thermal denaturation profiles of DNA and metaphase chromosomes in suspensions. Z. Naturforsch C 55: 737 – 746

90. Held N, **Hausmann M**, Perner B, Greulich KO (2000) Optische Rasternahfeldmikroskopie in der Zytogenetik. *CLB Chemie in Labor und Biotechnik* 51 (9/2000): 324 – 327
91. Rauch J, **Hausmann M**, Solovei I, Horsthemke B, Cremer T, Cremer C (2000) Measurement of local chromatin compaction by Spectral Precision Distance Microscopy. *Proc. SPIE* 4164: 1 – 9
92. Perner B, **Hausmann M**, Wollweber L, Rapp A, Monajembashi S, Greulich KO (2000) Scanning near-field optical microscopy after structure conserving air-drying. *Proc. SPIE* 4164: 10 – 17
93. Monajembashi S, Rapp A, **Hausmann M**, Dittmar H, Greulich KO (2000) Somatic S-phase pairing of homologous chromosome 3 in interphase nuclei of human peripheral blood lymphocytes. *Proc. SPIE* 4164: 28 – 35
94. Beuthan J, **Hausmann M**, Minet O, Perner B, Dressler C, Eberle HG (2001) Approximative determination of the modulation transfer function of the scanning near field microscope using biological samples. *Techn. Messen* 3/2001: 127 – 130
95. **Hausmann M**, Perner B, Rapp A, Scherthan H, Greulich KO (2001) SNOM imaging of mitotic and meiotic chromosomes. *Eur. Microsc. Anal.* 71 (5/2001): 5 – 7
96. Albrecht B, Schneider B, Schweitzer A, Failla AV, Jäger T, Kroll A, Hildenbrand G, Weisel A, **Hausmann M**, Edelmann P, Cremer C (2001) Distance measurements with axial precision in the nanometer range using Spatially Modulated Illumination Microscopy. *Proc. QMC* 2001: 203 – 207

2002 - 2005

97. **B Hausmann M**, Rauch J, Bornfleth H, Solovei I, Kreth G, Buiting K, Perner B, Rapp A, Horsthemke B, Cremer T, Cremer C (2002) The supra-molecular 3D-chromatin organisation of the Prader-Willi/Angelman syndrome subregion on chromosome 15. In: *Biophysics of the Genom and Its Interactions* (Ed.: Kozubek S, Kozubek M), Masaryk University, Brno (ISBN 80-210-2853-X): 28 – 35
98. **B** Kozubek M, Skalniková M, Matula Pe, Bártoová E, Eipel H, **Hausmann M** (2002) Development of software for automated micro-axialtomography. In: *Biophysics of the Genome and Its Interactions* (Ed.: Kozubek S, Kozubek M), Masaryk University, Brno (ISBN 80-210-2853-X): 45 – 53
99. **B** Skalniková M, Kozubek M, Bártoová E, Matula Pe, Eipel H, **Hausmann M** (2002) Optimisation of FISH methodology for study of 3D structure of cell nuclei using micro axial tomography. In: *Biophysics of the Genome and Its Interactions* (Ed.: Kozubek S, Kozubek M), Masaryk University, Brno (ISBN 80-210-2853-X): 82 – 85
100. Bártoová E, Kozubek S, Jirsová P, Kozubek M, Gajová H, Lukášová E, Skalniková M, Ganová A, Koutná I, **Hausmann M** (2002) Nuclear topography and gene activity in human differentiated cells. *J. Struct. Biol.* 139: 76 – 89
101. Perner B, Rapp A, Dressler C, Wollweber L, Beuthan J, Greulich KO, **Hausmann M** (2002) Variations in cell surfaces of estrogen treated breast cancer cells detected by a combined instrument for far-field and near-field microscopy. *Analyt. Cell. Pathol.* 24: 89 – 100
102. Kozubek M, Skalniková M, Matula Pe, Bártoová E, Rauch J, Neuhaus F, Eipel H, **Hausmann M** (2002) Automated micro axial tomography of cell nuclei after specific labelling by fluorescence in situ hybridisation. *Micron* 33: 655 – 665
103. Kozubek M, Matula Pe, Eipel H, **Hausmann M** (2002) Automated multi-view 3D image acquisition in human genome research. In: *3D-Data Processing, Visualization and Trans-mission*. IEEE Comp. Soc. (ISBN 0-7695-1521-5): 91 – 98
104. Winkler R, Perner B, Rapp A, Durm M, Cremer C, Greulich KO, **Hausmann M** (2003) Labelling quality and chromosome morphology after low temperature FISH analysed by scanning far-field and scanning near-field optical microscopy. *J. Microsc.* 209: 23 – 33
105. Matula P, Kozubek M, Staier F, **Hausmann M** (2003) Precise 3D image alignment in micro axial tomography. *J. Microsc.* 209: 126 – 142

106. Matula P, Skalníková M, Kozubek M, **Hausmann M** (2003) Improving measurement precision using automated micro-axial tomography. In: Biophysics of the Genome (Ed.: Kozubek S, Kozubek M, Krivankova H, Fucikova V), Masaryk University, Brno (ISBN 80-210-3226-X): 51 – 53
107. **Hausmann M**, Winkler R, Hildenbrand G, Finsterle J, Weisel A, Rapp A, Schmitt E, Janz S, Cremer C (2003) COMBO-FISH: specific labelling of nondenatured chromatin targets by computer-selected DNA oligonucleotide probe combinations. *Biotechniques* 35: 564 – 577
108. **Hausmann M**, Cremer C (2003) Standardisation of FISH-Procedures: Summary of the First Discussion Workshop. *Analyt. Cell. Pathol.* 25: 201 – 205
109. **Hausmann M**, Liebe B, Perner B, Jerratsch M, Greulich KO, Scherthan H (2003) Imaging of human meiotic chromosomes by scanning near-field optical microscopy (SNOM). *Micron* 34: 441 – 447
110. Albrecht B, **Hausmann M**, Zitzelsberger H, Stein H, Siewert JR, Hopt U, Langer R, Höfler H, Werner M, Walch A (2004) Array-based comparative genomic hybridization for the detection of DNA sequence copy number changes in Barrett's adenocarcinoma. *J. Pathol.* 203: 780 – 788
111. Rapp A, **Hausmann M**, Greulich KO (2004) The Comet-FISH technique. A tool for the detection of specific DNA damage and repair. *Meth. Mol. Biol.* 291: 107 – 120
112. **B Hausmann M** (2004) Flußzytometrie. In: Medizinische Physik, Band 3, Medizinische Laserphysik (Hrg. Bille J, Schlegel W) Springer Verlag, Heidelberg: 215 – 236
113. **Hausmann M**, Cremer C, Linares-Cruz G, Nebe TC, Peters K, Plesch A, Tham J, Vetter M, Werner M (2004) Standardisation of FISH-procedures: Summary of the second discussion workshop. *Cell. Oncol.* 26: 119 – 124
114. Monajembashi S, Rapp A, Schmitt E, Dittmar H, Greulich KO, **Hausmann M** (2005) Spatial association of homologous pericentric regions in human lymphocyte nuclei during repair. *Biophys. J.* 88: 2309 – 2322
115. Wiech T, Timme S, Riede F, Stein S, Schuricke M, Cremer C, Werner M, **Hausmann M**, Walch A (2005) Archival tissues provide a valuable source for the analysis of spatial genome organisation. *Histochem. Cell Biol.* 123: 229 – 238
116. Hildenbrand G, Rapp A, Spöri U, Wagner C, Cremer C, **Hausmann M** (2005) Nano-sizing of specific gene domains in intact human cell nuclei by Spatially Modulated Illumination (SMI) light microscopy. *Biophys. J.* 88: 4312 – 4318
117. **Hausmann M**, Hildenbrand G, Schwarz-Finsterle J, Birk U, Schneider H, Cremer C, Schmitt E (2005) New technologies measure genome domains – high resolution microscopy and novel labeling procedures enable 3-D studies of the functional architecture of gene domains in cell nuclei. *Biophotonics Int.* 12(10): 34 – 37
118. Schwarz-Finsterle J, Stein S, Großmann C, Schmitt E, Schneider H, Trakhtenbrot L, Rechavi G, Amariglio N, Cremer C, **Hausmann M** (2005) COMBO-FISH for focussed fluorescence labelling of gene domains: 3D-analysis of the genome architecture of *abl* and *bcr* in human blood cells. *Cell Biol. Intern.* 29: 1038 – 1046
119. Birk U, Baddeley D, Mathée H, Carl C, Hildenbrand G, Rapp A, Cardoso C, Martin S, Pombo A, **Hausmann M**, Cremer C (2005) Optical imaging of chromatin and protein complexes. *Mol. Imag.* 4: 224-225.

2006 - 2008

120. **Hausmann M**, Perner B, Rapp A, Scherthan H, Wollweber L, Greulich KO (2006) Near-field scanning optical microscopy in cell biology and cytogenetics. *Meth. Mol. Biol.* 319: 275 – 294
121. **B Nolte O**, Müller M, Häfner B, Knemeyer J-P, Stöhr K, Wolfrum J, Hakenbeck R, Denapante D, Schwarz-Finsterle J, Stein S, Schmitt E, Cremer C, Herten D-P, **Hausmann M**, Sauer M (2006) Novel singly labelled probes for identification of



- microorganisms, detection of antibiotic resistance genes and mutations, and tumor diagnosis (SMART PROBES). In: Biophotonics (Ed.: Popp J, Strehle M) Wiley-VCH, Weinheim: 167-230.
122. Schwarz-Finsterle J, Stein S, Großmann C, Schmitt E, Trakhtenbrot L, Rechavi G, Amariglio N, Cremer C, **Hausmann M** (2006/2007) Comparison of triplehelical COMBO-FISH and standard FISH by means of quantitative microscopic image analysis of abl/bcr genome organisation. *J. Biophys. Biochem. Meth.* [epub (Sept. 2006)] 70: 397-406.
  123. Kreth G, Pazhanisamy SK, **Hausmann M**, Cremer C (2007) Cell type – specific quantitative predictions of radiation – induced chromosome aberrations: A computer model approach. *Rad. Res.* 167: 115 – 125
  124. Stadler V, Beyer M, König K, Nesterov A, Torralba G, Lindenstruth V, **Hausmann M**, Bischoff FR, Breitling F (2007) Multifunctional CMOS microchip coatings for protein and peptide arrays. *J. Prot. Res.* 6: 3197-3202 [epub (Juli 2007)]
  125. Nesterov A, Löffler F, König K, Trunk U, Leibe K, Felgenhauer T, Stadler V, Bischoff FR, Breitling F, Lindenstruth V, **Hausmann M** (2007) Non – contact charge measurement of moving microparticles contacting dielectric surfaces. *Rev. Sci Instr.* 78: 075111-1 – 075111-6 [epub (Juli 2007)]
  126. Rauser S, Weis R, Braselmann H, Feith M, Stein H, Langer R, Hutzler P, **Hausmann M**, Lassmann S, Siewert JR, Höfler H, Werner M, Walch A (2007) Significance of HER2 low-level copy gain in Barrett's cancer: Implications for Fluorescence-in-situ-hybridization (FISH) testing in tissues. *Clin. Cancer Res.* 13: 5115-5123
  127. Nesterov A, Löffler F, König K, Trunk U, Leibe K, Felgenhauer T, Bischoff FR, Breitling F, Lindenstruth V, Stadler V, **Hausmann M** (2007) Measurement of triboelectric charging of moving micro particles by means of an inductive cylindrical probe. *J. Phys. D: Appl. Phys* 40: 6115-6120
  128. Rauch J, Knoch TA, Solovei I, Teller K, Stein S, Buiting K, Horsthemke B, Langowski J, Cremer T, **Hausmann M**, Cremer C (2007/2008) Lightoptical precision measurements of the active and inactive Prader-Willi Syndrome imprinted regions in human cell nuclei. *Differentiation* 76: 66-82 [epub (Nov. 2007) DOI:10.1111/j.1432-0436.2007.00237.x]
  129. Beyer M, Nesterov A, Block I, König K, Felgenhauer T, Fernandez S, Leibe K, Torralba G, **Hausmann M**, Trunk U, Lindenstruth V, Bischoff FR, Stadler V, Breitling F (2007) Combinatorial synthesis of peptide arrays onto a microchip. *Science* 318: 1888
  130. Nesterov A, König K, Felgenhauer T, Lindenstruth V, Trunk U, Fernandez S, **Hausmann M**, Bischoff FR, Breitling F, Stadler V (2008) Precise selective deposition of microparticles on electrodes of microelectronic chips. *Rev. Sci. Instr.* 79: 035106 [epub März 2008: DOI 10.1063/1.2900012]
  131. Bischoff FR, **Hausmann M**, Breitling F, Stadler V, Lindenstruth V (2008) Mit Silizium Mikrochips auf Antikörpersuche. Moderne „aktive“ Halbleiterchips erlauben die Konstruktion hochkomplexer, kombinatorischer Peptidarrays im Mikromaßstab. *GenomExpress* 1/2008: 20-22
  132. Stadler V, Felgenhauer T, Beyer M, Fernandez S, Leibe K, Güttler S, Gröning M, König K, Torralba G, **Hausmann M**, Lindenstruth V, Nesterov A, Block I, Pipkorn R, Poustka A, Bischoff FR, Breitling F (2008) Combinatorial synthesis of peptide arrays with a laser printer. *Angew. Chem. Int. Ed.* 47: 7132-7135 (DOI: 10.1002/anie.200801616)
  133. Stadler V, Felgenhauer T, Beyer M, Fernandez S, Leibe K, Güttler S, Gröning M, König K, Torralba G, **Hausmann M**, Lindenstruth V, Nesterov A, Block I, Pipkorn R, Poustka A, Bischoff FR, Breitling F (2008) Kombinatorische Synthese von Peptidarrays mit einem Laserdrucker. *Angew. Chem.* 120: 7241-7244 (DOI: 10.1002/ange.200801616)
  134. Riemer MO, Nikolopoulos E, Herr A, Wild PJ, **Hausmann M**, Wiech T, Orlowska-Volk M, Lassmann S, Walch A, Werner M (2008) Microarray comparative

genomic hybridization analysis of tubular breast carcinoma shows recurrent loss of the CDH13 locus on 16q. *Hum. Pathol.* 39: 1621-1629 (epub [doi:10.1016/j.humpath.2008.02.021](https://doi.org/10.1016/j.humpath.2008.02.021))

135. Lemmer P, Gunkel M, Baddeley D, Kaufmann R, Urich A, Weiland Y, Reymann J, Müller P, **Hausmann M**, Cremer C (2008) SPDM – light microscopy with single molecule resolution at the nanoscale. *Appl. Phys. B* 93: 1-12 (DOI 10.1007/s00340-008-3152-x)
136. Wiech T, Nikolopoulos E, **Hausmann M**, Walch A, Werner M, Fisch P (2008) A case of heterogeneous breast cancer with clonally expanded T-cells in HER2+ and metastasis of the HER2- tumor cells. *Breast J.* 14: 487-491

2009 - 2010

137. Kaufmann R, Lemmer P, Gunkel M, Weiland Y, Müller P, **Hausmann M**, Baddeley D, Amberger R, Cremer C (2009) SPDM – Single molecule superresolution of cellular nanostructures. *Proc. SPIE* 7185: 71850J1-71850J19 (DOI: 10.1117/12.809109)
138. Erenpreisa J, Cragg MS, Salmina K, **Hausmann M**, Scherthan H (2009) The role of meiotic cohesion REC8 in chromosome segregation in  $\gamma$  irradiation-induced endopolyploid tumour cells. *Exp. Cell Res.* 315: 2593-2603 (DOI:10.1016/j.yexcr.2009.05.011)
139. Wiech T, Stein S, Lachenmaier V, Schmitt E, Schwarz-Finsterle J, Wiech E, Hildenbrand G, Werner M, **Hausmann M** (2009) Spatial allelic imbalance of BCL2 genes and chromosome 18 territories in nonneoplastic and neoplastic cervical squamous epithelium. *Eur. Biophys. J.* 38: 793-806 (DOI 10.1007/s00249-009-0474-5)
140. Birk UJ, **Hausmann M** (2009) Festschrift to recognize and celebrate Christoph Cremer's contribution to the field of biophysics on the occasion of his 65th birthday. *Eur. Biophys. J* 38: 719-720 (DOI 10.1007/s00249-009-0500-7)
141. Schmitt E, Stein S, **Hausmann M** (2009) Conception of an image data base for cell nuclei and geometric algorithms for diagnosis and therapy monitoring (reviewed publication). In: *Healthgrid Research, Innovation and Business Case. Proceedings of HealthGrid 2009* (Eds: Solomonides T, Hofman-Apitius M, Freudigmann M, Semler SC, Legré Y, Kratz M), *Studies in Health Technology and Informatics* 147: 251-256 (ISBN: 978-1-60750-027-8)
142. Lemmer P, Gunkel M, Weiland Y, Müller P, Baddeley D, Kaufmann R, Urich A, Eipel H, Amberger R, **Hausmann M**, Cremer C (2009) Using conventional fluorescent markers for far-field fluorescence localization nanoscopy allows resolution in the 10 nm range. *J. Microsc.* 235: 163-171
143. Schirwitz C, Block I, König K, Nesterov A, Fernandez S, Felgenhauer T, Leibe K, Torralba G, **Hausmann M**, Lindenstruth V, Stadler V, Breitling F, Bischoff FR (2009) Combinatorial peptide synthesis on a microchip. *Curr. Protoc. Protein Sci.* Chapter 18: Unit 18.2 18.2.1-13 (DOI: 10.1002/0471140864.ps1802s57)
144. Börner K, Hermle J, Sommer C, Brown NP, Knapp B, Glass B, Kunkel J, Torralba G, Reymann J, Beil N, Beneke J, Pepperkok R, Schneider R, Ludwig T, **Hausmann M**, Hamprecht F, Erfle H, Kaderali L, Kräusslich H-G, Lehmann MJ (2010) From experimental setup to bioinformatics: a RNAi screening platform to identify host factors involved in HIV-1 replication. *Biotechnology J.* 5: 39-49
145. Nesterov A, Löffler F, Cheng Y-C, Torralba G, König K, **Hausmann M**, Lindenstruth V, Stadler V, Bischoff FR, Breitling F (2010) Characterization of triboelectrically charged particles deposited on dielectric surfaces. *J. Phys. D: Appl. Phys* 43: 165301 (6pp) (doi: 10.1088/0022-3727/43/16/165301)
146. **B** Hildenbrand G, **Hausmann M**, Weinschenk S (2010) Moderne Physik, biologische Systeme und komplementäre Medizin. In: *Handbuch Neuraltherapie* (Ed.: Weinschenk S), Elsevier Urban & Fischer, München: 175-182
147. König K, Block I, Nesterov-Müller A, Torralba G, Fernandez S, Felgenhauer T, Leibe K, Schirwitz C, Löffler F, Painke F, Wagner J, Trunk U, Bischoff FR, Breitling F,

- Stadler V, **Hausmann M**, Lindenstruth V (2010) Programmable high voltage CMOS chips for particle-based high-density combinatorial peptide synthesis. *Sens. Act. B* 147: 418-427
148. Schmitt E, Müller P, Stein S, Schwarz-Finsterle J, **Hausmann M** (2010) Cell nucleus architecture in health and medicine: Geometrical descriptors and their use in GRID based case studies. In: Healthgrid Applications and Core technologies. Proceedings of HealthGrid 2010 (Eds: Solomonides T, Blanquer I, Breton V, Glatard T, Legré Y), *Studies in Health Technology and Informatics* 159: 272-276 (ISBN: 978-1-60750-582-2)
149. Kepper N, Schmitt E, Lesnussa M, Weiland Y, Eussen HB, Grosveld F, **Hausmann M**, Knoch TA (2010) Visualization, analysis, and design of COMBO-FISH probes in the *Grid*-based GLOBE 3D genome platform. In: Healthgrid Applications and Core technologies. Proceedings of HealthGrid 2010 (Eds: Solomonides T, Blanquer I, Breton V, Glatard T, Legré Y), *Studies in Health Technology and Informatics* 159: 171-180 (ISBN: 978-1-60750-582-2)
150. Wagner J, Löffler F, König K, Fernandez S, Nesterov-Müller A, Breitling F, Bischoff FR, Stadler V, **Hausmann M**, Lindenstruth V (2010) Quality analysis of selective micro-particle deposition on electrically programmable surfaces. *Rev. Sci. Instr.* 81: 073703-1 – 073703-6
151. Bohn M, Diesinger P, Kaufmann R, Weiland Y, Müller P, Gunkel M, von Ketteler A, Lemmer P, **Hausmann M**, Heermann DW, Cremer C (2010) Localization microscopy reveals expression-dependent parameters of chromatin nanostructure. *Biophys. J.* 99: 1358-1367
152. **B** Cremer C, von Ketteler A, Lemmer P, Kaufmann R, Weiland Y, Müller P, **Hausmann M**, Gunkel M, Ruckelshausen T, Baddeley D, Amberger R (2010) Far field fluorescence microscopy of cellular structures at molecular optical resolution. In: *Nanoscopy and Multidimensional Optical Fluorescence Microscopy* (Ed.: Diasporo A), CRC Press, Taylor and Francis, Boca Raton, London, New York: 3.1 – 3.33
153. Schmitt E, Schwarz-Finsterle J, Stein S, Boxler C, Müller P, Mokhir A, Krämer R, Cremer C, **Hausmann M** (2010) Combinatorial Oligo FISH: Directed labelling of specific genome domains in differentially fixed cell material and live cells. *Meth. Molec. Biol.* 659: 185-202.
154. Müller P, Schmitt E, Jacob A, Hoheisel J, Kaufmann R, Cremer C, **Hausmann M** (2010) COMBO-FISH enables high precision localization microscopy as a prerequisite for nanostructure analysis of genome loci. *Int. J. Molec. Sci.* 11: 4094-4105
155. Grossmann C, Schwarz-Finsterle J, Schmitt E, Birk U, Hildenbrand G, Cremer C, Trakhtenbrot L, **Hausmann M** (2010) Variations of the spatial fluorescence distribution in ABL gene chromatin domains measured in blood cell nuclei by SMI microscopy after COMBO – FISH labelling. *Microscopy: Science, Technology, Applications and Education* (Méndez-Vilas A, Díaz Álvarez J, eds.) Vol. 1: 688-695.

#### 2011 - 2012

156. Kaufmann R, Müller P, Hildenbrand G, **Hausmann M**, Cremer C (2011) Analysis of Her2/neu membrane protein clusters in different types of breast cancer cells using localization microscopy. *J. Microsc.* 242: 46-54
157. Kaufmann R, Müller P, **Hausmann M**, Cremer C (2011) Imaging label-free intracellular structures by localisation microscopy. *Micron*: 42: 348-352
158. Löffler F, Wagner J, König K, Märkle F, Fernandez S, Schirwitz C, Torralba G, **Hausmann M**, Lindenstruth V, Bischoff FR, Breitling F, Nesterov A (2011) High-precision combinatorial deposition of micro particle patterns on a microelectronic chip. *Aerosol Sci. Technol.* 45: 65-74
159. Timme S, Schmitt E, Stein S, Schwarz-Finsterle J, Wagner J, Walch A, Werner M, **Hausmann M**, Wiech T (2011) Nuclear position and shape deformation of chromosome 8 territories in pancreatic ductal adenocarcinoma. *Analyt. Cell. Pathol.* 34: 21-33

160. Dickmann F, Falkner J, Gunia W, Hampe J, **Hausmann M**, Herrmann A, Kepper N, Knoch TA, Lauterbach S, Lippert J, Peter K, Schmitt E, Schwarzmann U, Solodenko J, Sommerfeld D, Steinke T, Weisbecker A, Sax U (2011/12) Solutions for biomedical grid computing – case studies from the D-Grid project Services@MediGRID. *J. Comput. Sci.* 3: 280-297 ([doi:10.1016/j.jocs.2011.06.006](https://doi.org/10.1016/j.jocs.2011.06.006)).
161. Wagner J, König K, Förtsch T, Löffler F, Fernandez S, Felgenhauer T, Painke F, Torralba G, Lindenstruth V, Stadler V, Bischoff FR, Breitling F, **Hausmann M**, Nesterov-Müller A (2011) Microparticle transfer onto pixel electrodes of 45 µm pitch on HV-CMOS chips – simulation and experiment. *Sens. Act. A* 172: 533-545 ([doi:10.1016/j.sna.2011.06.017](https://doi.org/10.1016/j.sna.2011.06.017))
162. Cremer C, Kaufmann R, Gunkel M, Pres S, Weiland Y, Müller P, Ruckelshausen T, Lemmer P, Geiger F, Degenhard M, Wege C, Lemmermann N, Holtappels R, Strickfaden H, **Hausmann M** (2011) Superresolution imaging of biological nanostructures by Spectral Precision Distance Microscopy (SPDM). *Review. Biotech. J.* 6: 1037-1051
163. Staier F, Eipel H, Matula P, Evsikov AV, Kozubek M, Cremer C, **Hausmann M** (2011) Micro Axial Tomography: a miniaturized, versatile stage device to overcome resolution anisotropy in fluorescence light microscopy. *Rev. Sci. Instr.* 82: 093701-1 – 093701-8
164. Grüll F, Kirchgessner M, Kaufmann R, **Hausmann M**, Kebschull U (2011) Accelerating image analysis for localization microscopy with FPGAs. *Proc. 21<sup>st</sup> Inter. Conf. Field Programmable Logic and Applications, Chania, Kreta, 5. – 7. 9. 2011: 1-5* ([doi: 10.1109/FPL.2011.11](https://doi.org/10.1109/FPL.2011.11))
165. Wagner J, Schmitt E, Riede F, **Hausmann M**, Hesser J (2011) Denoising and detection of Her2/neu gene amplication in fluorescence microscopic data. *Electr. Proc. Conf. Microscopic Image Analysis with Applications in Biology, 2011, Heidelberg* (peer reviewed): <http://www.miaab.org/miaab-2011-heidelberg-papers/miaab-2011-h-wagner.pdf>
166. Schmitt E, Wagner J, **Hausmann M** (2011/12) Combinatorial selection of short triplex forming oligonucleotides for fluorescence in situ hybridisation COMBO-FISH. *J. Comput. Sci.* 3: 328-334 ([doi:10.1016/j.jocs.2011.10.001](https://doi.org/10.1016/j.jocs.2011.10.001))
167. Löffler F, Schirwitz C, Wagner J, König K, Merkle F, **Hausmann M**, Bischoff, FR, Nesterov-Müller A, Breitling F (2012) Biomolecule arrays using functional combinatorial particle patterning on microchips. *Adv. Funct. Mat.* 22: 2503-2508 ([doi:10.1002/adfm.201103103](https://doi.org/10.1002/adfm.201103103))
168. Wagner J, Löffler F, Förtsch T, Schirwitz C, Fernandez S, Hinkers H, Arlinghaus HF, Painke F, König K, Bischoff R, Nesterov-Müller A, Breitling F, **Hausmann M**, Lindenstruth V (2012) Image processing quality analysis for particle based peptide array production on a microchip. In: *Advanced Image Acquisition, Processing Techniques and Applications I* (Ed. Dimitrios Ventzas), InTech, Rijeka (ISBN 978-953-51-0342-4): 55-72
169. Schmitt E, Falkner J, Kepper N, Weisbecker A, **Hausmann M** (2012) A computation service centered business model for clinical diagnostics based on image analysis of microscopic data. *Int. J. Economics and Business Modeling* 3: 192-199
170. Gruell F, Kunz M, **Hausmann M**, Kebschull U (2012) An implementation of 3D electron tomography on FPGAs. *IEEE Proc. ReConFig 2012, Cancun, Mexiko*
171. Müller P, Weiland Y, Kaufmann R, Gunkel M, Hillebrandt S, Cremer C, **Hausmann M** (2012) Analysis of fluorescent nanostructures in biological systems by means of Spectral Position Determination Microscopy (SPDM). In: *“Current microscopy contributions to advances in science and technology”* (Méndez-Vilas A, ed.), Vol. 1: 3-12

2013 - 2016

172. Zeller D, Kepper N, **Hausmann M**, Schmitt E (2013) Sequential and structural biophysical aspects of combinatorial oligo-FISH in Her2/neu breast cancer diagnostics. *IFMBE Proc.* 38: 82-85

173. **Hausmann M**, Müller P, Kaufmann R, Cremer C (2013) Entering the nanocosmos of the cell by means of spatial position determination microscopy (SPDM): Implications for medical diagnostics and radiation research. *IFMBE Proc.* 38: 93-95
174. Schwarz-Finsterle J, Scherthan H, Huna A, González P, Müller P, Schmitt E, Erenpreisa J, **Hausmann M** (2013) Volume increase and spatial shifts of chromosome territories in nuclei of radiation-induced polyploidizing tumour cells. *Mutat. Res.: Genet. Toxicol. Environ. Mutagen.* 756: 56-65 (<http://dx.doi.org/10.1016/j.mrgentox.2013.05.004>)
175. Burger N, Biswas A, Barzan D, Kirchner A, Hosser H, **Hausmann M**, Hildenbrand G, Herskind C, Wenz F, Veldwijk MR (2014) A method for the efficient cellular uptake and retention of small modified gold nanoparticles for the radiosensitization of cells. *Nanomedicine* 10: 1365-1373 (doi: [10.1016/j.nano.2014.03.011](http://dx.doi.org/10.1016/j.nano.2014.03.011))
176. Grunzke R, Hesser J, Starek J, Kepper N, Gesing S, Hardt M, Hartmann V, Kindermann S, Potthoff J, **Hausmann M**, Müller-Pfefferkorn R, Jäkel R (2014) Device-driven metadata management solution for scientific big data use cases. 22nd Euromicro Int. Conf. Parallel, Distributed, and Network-Based Processing (PDP 2014), February 2014, Turin, Italy. *IEEE Comp. Soc. Proc. PDP 2014*: 317 – 321 (doi: [10.1109/PDP.2014.119](http://dx.doi.org/10.1109/PDP.2014.119))
177. Falk M, **Hausmann M**, Lukášová E, Biswas A, Hildenbrand G, Davidková M, Krasavin E, Kleibl Z, Falková I, Ježková L, Štefančíková L, Ševčík J, Hofer M, Bačíková A, Matula P, Boreyko A, Vachelová J, Michaelidisová A, Kozubek S (2014) Determining OMICS spatiotemporal dimensions using exciting new nanoscopy techniques to assess complex cell responses to DNA damage – PART A (Radiomics). *Crit. Rev. Eukaryot. Gene Express.* 24: 205-223
178. Falk M, **Hausmann M**, Lukášová E, Biswas A, Hildenbrand G, Davidková M, Krasavin E, Kleibl Z, Falková I, Ježková L, Štefančíková L, Ševčík J, Hofer M, Bačíková A, Matula P, Boreyko A, Vachelová J, Michaelidisová A, Kozubek S (2014) Determining OMICS spatiotemporal dimensions using exciting new nanoscopy techniques to assess complex cell responses to DNA damage – PART B (Structuromics). *Crit. Rev. Eukaryot. Gene Express.* 24: 225-247
179. Müller P, Lemmermann NA, Kaufmann R, Gunkel M, Paech D, Hildenbrand G, Holtappels R, Cremer C, **Hausmann M** (2014) Spatial distribution and structural arrangement of a murine cytomegalovirus glycoprotein detected by SPDM localization microscopy (mit Titelbild). *Histochem. Cell Biol.* 142: 61-67
180. Cremer C, Kaufmann R, Gunkel M, Polanski F, Müller P, Dierkes R, Degenhard S, Wege C, **Hausmann M**, Birk U (2014) Application perspectives of localization microscopy in virology. *Histochem. Cell Biol.* 142: 43-59
181. Prabhune A, Stotzka R, Jejkal T, Hartmann V, Bach M, Schmitt E, **Hausmann M**, Hesser J (2015) An Optimized Generic Client Service API for Managing Large Datasets within a Data Repository. *Proceedings of the 2015 IEEE First International Conference on Big Data Computing Service and Applications (BigDataService 2015)*, San Francisco: Paper ID 33
182. Zhang Y, Máté G, Müller P, Hillebrandt S, Krufczik M, Bach M, Kaufmann R, **Hausmann M**, Heermann DW (2015) Radiation induced chromatin conformation changes analysed by fluorescent localization microscopy, statistical physics, and graph theory. *PLoS ONE* 10: e0128555. doi:10.1371/journal.pone.0128555
183. Stuhlmüller M, Schwarz-Finsterle J, Fey E, Lux J, Bach M, Cremer C, Hinderhofer K, **Hausmann M**, Hildenbrand G (2015) In situ optical sequencing and nano-structure analysis of a trinucleotide expansion region by localization microscopy after specific COMBO-FISH labelling. *Nanoscale* 7: 17938-17946 (DOI: [10.1039/C5NR04141D](http://dx.doi.org/10.1039/C5NR04141D))
184. Stuhlmüller M, **Hausmann M** (2015) Selection of COMBO-FISH probes for multi-purpose applications. *J. Theor. Comput. Sci.* 2: 131-132 (DOI: [10.4172/2376-130X.1000131](http://dx.doi.org/10.4172/2376-130X.1000131))

185. Bigge K, Čermák D, Schubert V, Guerin EA, Blessenohl MA, Passenberg F, Bach M, **Hausmann M**, Hildenbrand G (2015) FLASH for biological dosimetry experiments – A Bexus 16 project. Proc 22nd ESA Symp Europ Rocket and Balloon Programmes and Related Research, Tromsø, 7. – 12. 06. 2015, ESA Sp-730, September 2015: 251 – 258
186. Pilarczyk G, Raulf A, Gunkel M, Fleischmann BK, Lemor R, **Hausmann M** (2016) Tissue mimicking geometrical constraints stimulate tissue-like constitution and activity of mouse neonatal and human induced pluripotent stem cell-derived cardiac myocytes. *J. Funct. Biomat.* 7(1), 1: doi:10.3390/jfb7010001
187. Moser F, Hildenbrand G, Müller P, Al Saroori A, Biswas A, Bach M, Wenz F, Cremer C, Burger N, Veldwijk M, **Hausmann M** (2016) Cellular uptake of gold nanoparticles and their behavior as labels for localization microscopy. *Biophys J* 110: 947-953
188. Bosiek K, **Hausmann M**, Hildenbrand G (2016) Perspectives on comets, comet-like asteroids, and their predisposition to provide an environment that is friendly to life. *Astrobiology* 16(4): 311-323 (doi:10.1089/ast.2015.1354)
189. Aschenbrenner KP, Butzek S, Guthier CV, Krufczik M, **Hausmann M**, Bestvater F, Hesser J (2016) Compressed sensing denoising for segmentation of localization microscopy data. *IEEE Int. Conf. Comput. Intelligence Bioinf. Comput. Biol. (CIBCB 2016, 5.- 7. 10. 2016, Chiang Mai, Thailand):* 1-5 (DOI: 10.1109/CIBCB.2016.7758097)
190. Müller P, Rößler J, Schwarz-Finsterle J, Schmitt E, **Hausmann M** (2016) PNA-COMBO-FISH: From combinatorial probe design in silico to vitality compatible, specific labelling of gene targets in cell nuclei. *Exp Cell Res* 345: 51-59
191. Boyd PS, Struve N, Bach M, Eberle JP, Gote M, Schock F, Cremer C, Kriegs M, **Hausmann M** (2016) Clustered localization of EGFRvIII in glioblastoma cells as detected by high precision localization microscopy. *Nanoscale* 8: 20037-20047 (DOI: 10.1039/c6nr05880a)

2017-2018

192. Ngwa W, Boateng F, Kumar R, Irvine DJ, Formenti S, Ngoma T, Herskind C, Veldwijk MR, Hildenbrand GL, **Hausmann M**, Wenz F, Hesser J (2017) Critical review: Smart radiotherapy biomaterials. *Int J Radiation Oncol Biol Phys* 97: 624-637 (<http://dx.doi.org/10.1016/j.ijrobp.2016.10.034>)
193. Pilarczyk G, Nesnidal I, Gunkel M, Bach M, Bestvater F, **Hausmann M** (2017) Localisation microscopy of breast epithelial ErbB-2 receptors and gap junctions: Trafficking after gamma-irradiation, Neuregulin-1b and Herceptin application. *Int J Mol Sci* 18: 362; doi:10.3390/ijms18020362
194. Sievers A, Bosiek K, Bisch M, Dreessen C, Riedel J, Froß P, **Hausmann M**, Hildenbrand G (2017) Kmer content, correlation and position analysis of genome DNA sequences for identification of function and evolutionary features. *Genes* 8: 122; doi:10.3390/genes8040122
195. Krufczik M, Sievers A, Hausmann A, Lee J-H, Hildenbrand G, Schaufler W, **Hausmann M** (2017) Combining low temperature fluorescence DNA-hybridization, immunostaining, and super-resolution localization microscopy for nano-structure analysis of ALU elements and their influence on chromatin structure. *Int J Mol Sci* 18: 1005; doi:10.3390/ijms18051005
196. Bach M, Savini C, Krufczik M, Cremer C, Rösl F, **Hausmann M** (2017) Super-resolution localization microscopy of  $\gamma$ -H2AX and heterochromatin after folate deficiency. *Int. J. Mol. Sci.* 18: 1726; doi:10.3390/ijms18081726
197. **Hausmann M**, Ilić N, Pilarczyk G, Lee J-H, Logeswaran A, Borroni AP, Krufczik M, Theda F, Waltrich N, Bestvater F, Hildenbrand G, Cremer C, Blank M (2017) Challenges for super-resolution localization microscopy and biomolecular fluorescent nano-probing in cancer research. *Int. J. Mol. Sci.* 18: 2066; doi:10.3390/ijms18102066

198. Eberle JP, Rapp A, Krufczik M, Eryilmaz M, Gunkel M, Erfle H, **Hausmann M** (2017) Super-resolution microscopy techniques and their potential for applications in radiation biophysics. In: "Super-resolution Microscopy – Methods and Protocols" (Erfle H, ed.) Meth. Molec. Biol. 1663: 1-13
199. **Hausmann M** (2017) In memoriam Prof. Dr. Jürgen Kiefer. Radiat. Environ. Biophys.: DOI 10.1007/s00411-017-0715-4
200. Hildenbrand G, Metzler P, Pilarczyk G, Bobu V, Kriz W, Hosser H, Fleckenstein J, Krufczik M, Bestvater F, Wenz F, **Hausmann M** (2018) Dose enhancement effects of gold nanoparticles specifically targeting RNA in breast cancer cells. PLoS ONE 13(1): e0190183. <https://doi.org/10.1371/journal.pone.0190183>
201. Eryilmaz M, Schmitt E, Krufczik M, Theda F, Lee J-H, Cremer C, Bestvater F, Schaufler W, **Hausmann M**, Hildenbrand G (2018) Localization microscopy analyses of MRE11 clusters in 3D-conserved cell nuclei of different cell lines. Cancers 10: 25; doi:10.3390/cancers10010025
202. **Hausmann M**, Wagner E, Lee J-H, Schrock G, Schaufler W, Krufczik M, Papenfuß F, Port M, Bestvater F, Scherthan H (2018) Super-resolution microscopy of radiation-induced histone H2AX phosphorylation in relation to H3K9-trimethylation in HeLa cells. Nanoscale 10: 4320-4331; doi:10.1039/C7NR08145F
203. Hofmann A, Krufczik M, Heermann DW, **Hausmann M** (2018) Using persistent homology as a new approach for super-resolution localization microscopy data analysis and classification of  $\gamma$ H2AX foci/clusters. Int. J. Mol. Sci. 2018, 19, 2263; doi:10.3390/ijms19082263
204. Depes D, Lee J-H, Bobkova E, Jezkova L, Falkova I, Bestvater F, Pagacova E, Kopečna O, Zadneprianetc M, Bacikova A, Kulikova E, Smirnova E, Bulanova T, Boreyko A, Krasavin E, **Hausmann M**, Falk M (2018) Single molecule localization microscopy as a promising tool for  $\gamma$ H2AX/53BP1 foci exploration. Eur. Phys. J. D 72: 158; doi: 10.1140/epjd/e2018-90148-1
205. Sievers A, Wenz F, **Hausmann M**, Hildenbrand G (2018) Conservation of k-mer composition and correlation contribution between introns and intergenic regions of animalia genomes. Genes 9: 482; doi:10.3390/genes9100482
206. Bobkova E, Depes D, Lee J-H, Jezkova L, Falkova I, Pagacova E, Kopečna O, Zadneprianetc M, Bacikova A, Kulikova E, Smirnova E, Bulanova T, Boreyko A, Krasavin E, Wenz F, Bestvater F, Hildenbrand G, **Hausmann M**, Falk M (2018) Recruitment of 53BP1 proteins for DNA repair and persistence of repair clusters differ for cell types as detected by single molecule localization microscopy. Int. J. Molec. Sci. 19: 3713. doi:10.3390/ijms19123713

#### 2019-2020

207. Pagáčová E, Štefančíková L, Schmidt-Kaler F, Hildenbrand G, Vičar T, Depeš D, Lee J-H, Bestvater F, Lacombe S, Porcel E, Roux S, Wenz F, Kopečná O, Falková I, **Hausmann M**, Falk M (2019) Challenges and contradictions of metal nano-particle applications for radio-sensitivity enhancement in cancer therapy. Int. J. Molec. Sci. 20: 588. doi:10.3390/ijms20030588
208. Lee J-H, Laure Djikimi Tchétgna F, Krufczik M, Schmitt E, Cremer C, Bestvater F, **Hausmann M** (2019) COMBO-FISH: A versatile tool beyond standard FISH to study chromatin organization by fluorescence light microscopy. OBM Genetics 3(1): doi:10.21926/obm.genet.1901064
209. Pilarczyk G., Papenfuß F, Bestvater F, **Hausmann M** (2019) Spatial arrangements of Connexin43 in cancer related cells and re-arrangements under treatment conditions: Investigations on the nano-scale by super-resolution localization light microscopy. Cancers 11: 301. doi:10.3390/cancers11030301
210. Greinert R, **Hausmann M** (2019) Obituary Prof. Dr. Dietrich Harder (11 February 1930–10 February 2019). Radiat. Environ. Biophys. 58(2): 137 (doi.org/10.1007/s00411-019-00791-4)
211. Salmina K, Gerashchenko BI, **Hausmann M**, Vainshelbaum NM, Zayakin P, Erenpreiss J, Freivalds T, Cragg MS, Erenpreisa J (2019) When three isn't a crowd: A

- digyny concept for treatment-resistant, near-triploid human cancers. *Genes* 10(7): 551; <https://doi.org/10.3390/genes10070551>
212. Scherthan H, Lee J-H, Maus E, Schumann S, Muhtadi R, Chojowski R, Port M, Lassmann M, Bestvater F, **Hausmann M** (2019) Nanostructure of clustered DNA damage in leukocytes after in-solution irradiation with the alpha emitter Ra-223. *Cancers* 11: 1877; doi:10.3390/cancers11121877 Krigerts J, Salmina K, Freivalds T, Rumnieks F, Inashkina I, Zayakin P, **Hausmann M**, Erenpreisa J (2020) Early critical phase transitions of pericentromere-associated domains in MCF-7 breast cancer cells committed to differentiation by heregulin. *Preprints 2020: 2020050248*; doi: 10.20944/preprints202005.0248.v1
213. **B Hausmann M**, Lee J-H, Hildenbrand G (2020) 3D DNA FISH for analyses of chromatin-nuclear architecture. In: "Epigenetics Methods", Vol 18 (ed. Tollefsbol T) Elsevier Academic Press: pp 399-418; doi.org/10.1016/B978-0-12-819414-0.00020-3
214. **B Hildenbrand G**, Weinschenk S, **Hausmann M** (2020) Moderne Physik, biologische Systeme und komplementäre Medizin. In: *Handbuch Neuraltherapie*, 2. Auflage (Ed.: Weinschenk S), Georg Thieme Verlag, Stuttgart: 159-167
215. Bartosova M, Herzog R, Ridinger D, Levai E, Jenei H, Zhang C, González Mateo GT, Marinovic I, Hackert T, Bestvater F, **Hausmann M**, López Cabrera M, Kratochwill K, Zarogiannis SG, Schmitt CP (2020) Alanyl-glutamine restores tight junction organization after disruption by a conventional peritoneal dialysis fluid. *Biomolecules* 10: 1178; doi: 10.3390/biom10081178
216. **B Hausmann M**, Lee J-H, Sievers A, Krufczik M, Hildenbrand G (2020) COMBinatorial Oligonucleotide FISH (COMBO-FISH) with uniquely binding repetitive DNA probes (inclusive cover page). *The Nucleus* (ed. Hancock R), *Methods in Molecular Biology*. 2175: 65-77; [https://doi.org/10.1007/978-1-0716-0763-3\\_6](https://doi.org/10.1007/978-1-0716-0763-3_6)
217. **Hausmann M**, Neitzel C, Bobkova E, Nagel D, Hofmann A, Chramko T, Smirnova E, Kopečná O, Pagáčová E, Boreyko A, Krasavin E, Falkova I, Heermann DW, Pilarczyk G, Hildenbrand G, Bestvater F, Falk M (2020) Single Molecule Localization Microscopy analyses of DNA-repair foci and clusters detected along particle damage tracks. *Front. Phys.* 8: 578662; doi: 10.3389/fphy.2020.578662
218. **B Hausmann M**, Pilarczyk G, Maus E, Hesser J, Hildenbrand G (2020) Super-Resolution Microscopy of nanogold-labelling. In: "Nanoparticle Enhanced Radiation Therapy – Principles, Methods and Applications" (eds. Sajo E, Zygmanski P), IOP Publishing Ltd 2020, pp. 11-1 – 11-8; <https://doi.org/10.1088/978-0-7503-2396-3ch11>
219. **B Falk M**, Wolinsky M, Veldwijk MR, Hildenbrand G, **Hausmann M** (2020) Gold nanoparticle enhanced radiosensitivity of cells: Considerations and contradictions from model systems and basic investigations of cell damaging for radiation therapy. In: "Nanoparticle Enhanced Radiation Therapy – Principles, Methods and Applications" (eds. Sajo E, Zygmanski P), IOP Publishing Ltd 2020, pp. 10-1 – 10-25; <https://doi.org/10.1088/978-0-7503-2396-3ch10>
220. Falk M, **Hausmann M** (2020). Nové poznatky o poškození buněk a chromatinu (DNA) různými druhy ionizujícího záření v éře pokročilé optické mikroskopie a nanoskopie [New discoveries on cell and chromatin damage by different types of ionizing radiation in the era of advanced optical microscopy and nanoscopy]. *Časopis lékařů českých [Čas Lék čes. = Journal Czech Physicians]* 159: 286-297