

Curriculum Vitae Ludwig A. Hothorn

Date & Place of Birth May, 17th 1949 in Gera

Citizenship Federal Republic of Germany

Education

1967 - 1971 Technical University of Dresden
(HS-Ing.) (Chemical Engineering)
1971 - 1974 Technical University of Dresden
Dr.-Ing. (Thesis: Mathematical Modelling)
1978 - 1980 Statistics; University of Freiberg (postgraduate)
1982 - 1988 Martin Luther University of Halle (external)
Dr.sc.nat. (Thesis: Multiple Comparison Procedures in Dose-Response Relationships)
1991 Martin Luther University of Halle: Dr.rer.nat.habil
1992 Certificate: Biometry in Medicine by German Region of IBS



Societies The International Biometric Society (IBS)

Society Appointments

- Council Member, Society of Biomathematics and Biophysics (1986-1990)
- Head of the working party 'Bioassay' (in the Society of Biomathematics) (1982 -1990)
- Head of the ad-hoc working group 'Statistical methods in preclinical research (German Region of Biometric Society) (1991 – 1997)
- Vice speaker of the AG Pharmazeutische Forschung (German Region of Biometric Society) (1993 – 1997)
- Speaker of the AG Multiple Methods (German Region of Biometric Society) (1997-2000)
- Council member, International Biometric Society (2002-2009)
- Council member, German Region of the International Biometric Society (2004-2006)
- Vice-President German Region of the International Biometric Society (2006-2007)
- President German Region of the International Biometric Society (2007-2009)
- Vice-President German Region of the International Biometric Society (2009-2010)

Sabbaticals 1998 Department of Epidemiology and Biostatistics, University of California at San Francisco, USA
2003 Department of Biostatistics, University of Aarhus, Denmark
2009 Scripps Genomic Medicine, La Jolla, USA
2013 Medical University of Vienna, Austria

Research Interests

- Statistical Methods in Dose-Response Analysis, with Applications in Biology, Genetics, Agriculture, Toxicology, Pharmacology and Medicine
- Order-restricted Tests and Multiplicity Issues
- Statistical Methods in Life Sciences (Agriculture and Horticulture)
- Statistical Methods in quantitative Genetics
- Computational Statistics using R

Awards

- 2008 Best Presentation at LifeStat2008 Munich, "A prospectively planned pooled meta-analysis of the association between chromosome 9p21.3 and coronary artery disease" together with A. Götz, I. R. König, et al.
- 2010 First level award of Pharma Technik 2010 for "An Alternative to Animal Experiments in the Quality Control of Erythropoietin. PHARMAZEUTISCHE INDUSTRIE72 (2010) 708-712, together with Zimmermann H, Gerhard D.

Publications in peer-reviewed international journals

1. Chemnitz, K.H. et al.: Untersuchung der Langzeittoxizität von Nourseoethricin. Arch.exp. Vet. Med. 40 (1986) 744-753.
2. **Hothorn, L.:** A simple statistical procedure for testing tumour rates in animal carcinogenicity experiments. Arch. Toxicol. Suppl. 13 (1989) 265-268
3. **Hothorn, L.:** On the behaviour of Fligner/Wolfe trend test 'control versus k treatments', with application in toxicology. Biometr. J. 31 (1989) 767-780.
4. **Hothorn, L.:** Robustness study on Williams and Shirley procedure, with application in toxicology. Biometr. J. 31 (1989) 891-903.
5. **Hothorn, L.** and Lehmann, W.: A simple testing procedure 'control versus k treatments' for one-sided ordered alternatives. Biometr. J. 33 (1991) 179-189.
6. Solecki, R. Hothorn, L. et al. : Computerised analysis of pathological findings in longterm trials with Phenylmercuric acetate in rats. Arch. Toxicol. 14 (1991) 100-103.
7. Kälble, T., Hothorn, L. et al.: Tumor induction in a rat model for uterosigmoidos-tomy without evidence of nitrosamine formation. J. Urology 146 (1991) 3,862-866.
8. Krifka, F.J., Hothorn, L. et al. : Vergleichende Untersuchungen zweier Patientengruppen mit primären Mundhöhlenkarzinom aus dem Zeitraum 1981 bis 1989. Fortschr. Kiefer Gesichtschirurgie 37 (1992) 40-43.
9. **Hothorn, L.:** Multiple comparisons in long-term toxicity studies. Environ. Health Perspect. 102 (1994) Suppl. 1, 33-38.
10. **Hothorn, L.:** Biostatistical analysis of the micronucleus mutagenicity assay based on the assumption of a mixing distribution. Environ. Health Perspect. 102 (1994) Suppl. 1, 33-38.
11. **Hothorn, L. A.** and Hajian, G.: Biostatistics aspects of toxicokinetics. Drug Information Journal 28 (1994) 187-190.
12. Hauschke, D, Steinijans, V.W. and Hothorn, L.A.: A note on Welch's approximate t-solution to bioequivalence assessment. Biometrika 83 (1996) 236-237.
13. Neuhäuser, M. and Hothorn, L.A.: The control of consumer's risk in the Ames mutagenicity assay. Drug Information J. 30 (1997)2, 363-367.
14. Neuhäuser, M. and Hothorn, L.A.: Trend tests for dichotomous endpoints with application in carcinogenicity studies. Drug Information J. 30 (1997)2, 463-469
15. Kropf, S.; Hothorn, L.A. and J. Läuter: Multivariate many-to-one procedures with applications to pre-clinical trials. Drug Information J. 30 (1997)2, 433-447
16. **Hothorn, L.A.** and U. Martin: Application of adaptive interim analysis in pharmacology. Drug Information J. 30 (1997)2,615-619
17. **Hothorn, L.A.:** Modifications of the closure principle for analyzing toxicological studies. Drug Information J. 30 (1997)2,403-412
18. **Hothorn, L.A.;** Lin, K.K.; Hamada, C. and Rebel,W.: Recommendations for Biostatistics of Repeated Toxicity Studies Drug Information J. 30 (1997)2,327-334
19. **Hothorn, L.A.;** Neuhäuser, M and Koch H.-F.: Analysis of randomized dose-finding studies: closure test modifications based on multiple contrast tests. Biometrical J. 39(1997), 467-479.
20. Lalla S, Hothorn LA, Haag N, Bader R, Bauss F: Lifelong administration of high doses of ibandronate increases bone mass and maintains bone quality of lumbar vertebrae in rats. Osteoporos Int 1998;8(2):97-103
21. Bolte R, Walz M, ..., Hothorn L, Georgi M: Teleradiology: results of a questionnaire of German radiologists. J Telemed Telecare 1998;4 Suppl 1:69-71
22. Fairweather, W.R., Bhattacharya, A, ..., Hothorn, L.A. et al.: Biostatistical methodology in carcinogenicity studies. Drug Information J. 32 (1998) 401-421.
23. Neuhäuser, M. and Hothorn, L.A.: An analogue of Jonckheere's trend test for parametric and dichotomous data. Biometr. J. 40 (1998) 11-19.
24. Neuhäuser, M., Liu, P-Y. and Hothorn, L.A.: Nonparametric tests for trend: Jonckheere's test, a modification and a maximum test. Biometr. J. 40 (1998) 899-909.
25. Bauer P, Röhmel J, Maurer W, Hothorn L.A.: Testing strategies in multi-dose experiments including active control. Statistics in Medicine 1998 17(18):2133-46.
26. Hauschke, D.; Kieser, M.; Hothorn, L.A.: Proof of safety in toxicology based on the ratio of two means for normally distributed data. Biometr. J. 41(1999) 295-304
27. Neuhäuser, M. and Hothorn, L.A.: An exact Cochran-Armitage test for trend when dose-response shapes are a priori unknown. Computat. Stat. & Data Analysis 30 (1999) 403-412.
28. **Hothorn, L.A.:** Trend tests in epidemiology: p-values or confidence intervals?. Biometr. J. 41 (1999)817-825.
29. Koch, Hans-Friedrich; Hothorn, L.A.: Exact unconditional distributions for dichotomous data in many-to-one comparisons. J. Statist. Planning Inference 82 (1999),1-2, 83-99.
30. **Hothorn, L.A.,** and Hauschke, D.: Identifying the maximum safe dose: a multiple testing approach. J. Biopharmaceutical Statistics 10 (2000) 15-30.
31. Lovell DP, Yoshimura I, Hothorn LA, Margolin BH, Soper K.: Report and summary of the major conclusions from Statistics in Genotoxicity Testing Working Group from the Intern. Workshop on Genotoxicity Test Procedures Environ Mol Mutagen. 2000;35(3):260-263.
32. Neuhäuser M; Seidel D; Hothorn LA; Urfer W.: Robust trend tests with application to toxicology. Environmental and Ecological Statistics 7 (2000)43-56.

33. **Hothorn LA**; Hayashi M; Seidel D.: Dose-response relationships in mutagenicity assays including an appropriate positive control group: a multiple testing approach. *Environmental and Ecological Statistics* 7 (2000) 27-42.
34. Bretz F, Hothorn LA. A powerful alternative to Williams' test with application to toxicological dose-response relationships of normally distributed data. *Environmental and Ecological Statistics* 7 (2000) 135-154.
35. Lehmacher, W; Kieser, M; Hothorn, L.A.: Sequential and multiple testing for dose-response analysis. *Drug Information Journal*, 34 (2000), 591-597.
36. Neuhäuser M; Hothorn LA.: Parametric location-scale and scale trend tests based on Levene's transformation. *Computational Statistics and Data Analysis* 33(2000) 189-200.
37. **Hothorn, L.A.**, and Bretz, F.: Evaluation of animal carcinogenicity studies. Cochran-Armitage trend test vs. multiple contrast tests. *Biometrical J.* 42 (2000) 553-567
38. **Hothorn, L.A.**, and Bretz, F.: One-sided simultaneous confidence intervals for effective dose steps in unbalanced designs. *Biometrical J.* 42 (2000) 995-1006.
39. Tamhane A.C. and Hothorn, L.A. A multiple comparison procedure for the three and four-armed controlled clinical trials (Letter to the editor). *Statistics in Medicine* 20 (2001) 317-321.
40. Munzel, U. and Hothorn, L.A.: An unified approach to simultaneous rank test procedures in the unbalanced one-way layout. *Biometrical Journal* 43(2001) 553-559.
41. Bretz, F, Genz, A, and Hothorn, L.A. : On the numerical availability of multiple comparison procedures. *Biometrical Journal* 43(2001) 645-656.
42. Bretz, F and Hothorn, L.A.. Testing dose-response relationships with a priori unknown possibly nonmonotone shapes. *J. Biopharmaceutical Statistics* 11(2001) 193-207.
43. Biesheuvel E., and Hothorn, LA.: Many-to-one comparisons in stratified designs *Biometrical Journal* 44(2002) 101-116.
44. Bauss F, Wagner M, Hothorn, LA: Total administered dose of Ibandronate determines its effect on bone mass. *J. of Rheumatology* 29 (2002) 990-998.
45. Weichert M, Hothorn LA.: Robust hybrid tests for the two-sample location problem. *Commun. Statist. Simul C* 31 (2002) 175-187.
46. Bauss F., Lalla S., Endelev R., and L.A. Hothorn: The effects of treatment with ibandronate on bone mass, architecture, biomechanical properties and bone concentration of ibandronate in ovariectomized aged rats. *J Rheumatol* 29 (10): 2200-2208 (2002)
47. Bretz, F and Hothorn, L.A. Detecting dose-response using contrasts: asymptotic power and sample size determination for binomial data. *Statist. Med.* 2002; 21:3325-3335
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49. **Hothorn, L.A.** Selected biostatistical aspects of the validation of in vitro toxicological assays. *Altern Lab Anim.* 30(2002) Suppl 2:93-8.
50. Bretz, F.; Hothorn, L.A., Hsu J. Identifying effective and/or safe doses by stepwise confidence intervals for ratios. *Statistics in Medicine* 22 (2003) 847-858
51. Neuhauser M, Leisler B, Hothorn LA: A trend test for the analysis of multiple paternity. *J AGRIC BIOL ENVIR S* 8 (2003) 29-35.
52. **Hothorn, L.A.**; Wassmer, G. Analyzing randomized dose finding studies with a primary and a secondary endpoint. *J Biopharmaceutical Statistics* 13(2003) 301-305.
53. Bretz F, Hothorn LA. Comparison of exact and resampling based multiple testing procedures. *COMMUN STAT-SIMUL C* 32 (2): 461-473 2003
54. **Hothorn LA** . Statistics of interlaboratory in vitro toxicological studies. *ATLA-ALTERN LAB ANIM* 31: 43-63 Suppl. 1 JUN 2003
55. Hauschke D, Hothorn LA. Two-stage testing of safety: A statistical view. *ATLA-ALTERN LAB ANIM* 31: 77-80 Suppl. 1 JUN 2003
56. Bretz F, Hothorn LA . Statistical analysis of monotone or non-monotone dose-response data from in vitro toxicological assays. *ATLA-ALTERN LAB ANIM* 31: 81-96 Suppl. 1 JUN 2003
57. **Hothorn LA**, Bretz F . Dose-response and thresholds in mutagenicity studies: A statistical testing approach. *ATLA-ALTERN LAB ANIM* 31: 97-103 Suppl. 1 JUN 2003
58. Biesheuvel E., and Hothorn, LA: Protocol designed subgroup analyses in multiarmed clinical trials: multiplicity aspects *J. Biopharmaceutical Statistics* 13(2003) 663-673
59. Hirotsu C, and Hothorn, LA: Impact of the ICH E9 guideline: statistical principles for clinical trials on the conduct of clinical trials in Japan. *Drug Information Journal* 37 (2003) 381-396
60. Neuhauser M, Buening H, Hothorn L: Maximum test versus adaptive tests for the two-sample location problem. *J APPL STAT* 31 (2): 215-227 FEB 2004
61. **Hothorn, LA** and Bauss, F. Biostatistical design and analyses of long-term animal studies simulating human postmenopausal osteoporosis. *Drug Information Journal* 38 (2004) 47-56.
62. **Hothorn, LA** A robust statistical procedure for evaluating genotoxicity data. *Environmetrics* 15 (2004) 635-641
63. Dilba, D, Bretz, F, Guiard, V, Hothorn, LA. Simultaneous confidence intervals for ratios with application to the comparison of several treatments with a control. *Meth. Inf Medicine* 43: 2004, 465-469.
64. **Hothorn, LA** Biostatistics in nonclinical and preclinical drug development. *Biometrical J* 47 (2005) 282-285
65. **Hothorn, LA**; Oberdörfer, R: Statistical analysis used in the nutritional assessment of novel food using the proof of safety. *Regul Toxicol. Pharmacol* 44 (2006), 125-135
66. Dilba, D, Bretz, F., Hothorn, LA. Guiard, V. Power and sample size computations in simultaneous tests for non-inferiority based on relative margins. *Statist. Medicine* 25 (2006) 1131-1147
67. Eckert, J; Schuphan L, Hothorn, LA; Gathmann A. Arthropods on Maize Ears for Detecting Impacts of Bt Maize on Nontarget Organisms. *Environ. Entomol.* 35 (2006) 554-560.
68. Gathmann, A; Wirooks, L; Hothorn, LA; Bartsch, Schuphan, I. Impact of Bt maize pollen (MON810) on lepidopteran larvae living on accompanying weeds. *Molecular Ecology* (2006) 15: 2677-2685.
69. **Hothorn LA**. Statistical analysis of in vivo anticancer experiments: Tumor growth inhibition. *Drug Inf. J* (2006) 40: 229-238.
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71. **Hothorn, LA**, Bleiholder H. Statistical effects of efficacy evaluation of plant protection products in field trials- a comment to EPPO standard PP1/152. EPPO Bulletin (2006) 36: 31-45.
72. **Hothorn, LA** Multiple comparisons and multiple contrasts in randomized dose-response trials- confidence interval orient approaches. J. Biopharm Stat. (2006) 16: 711-731.
73. Hauschke D, Hothorn LA Letter to Editor: An introductory note to the CHMP guidelines: choice of the non-inferiority margin and data monitoring committees by David Brown, Peter Volkers and Simon Day, Statistics in Medicine 2006; 25:1623–1627. Statist. Med. 2007; 26:230–236
74. Dilba, D, Schaarschmidt, F., Hothorn, LA Inferences for ratios of normal means. RNews 7 (2007) 1, 20 -23.
75. **Hothorn LA** How to deal with multiple treatment or dose groups in randomized clinical trials? Fundam Clin Pharmacol 21 (2): 137-154 2007
76. Toschki A, Hothorn LA, Ross-Nickoll M Effects of cultivation of genetically modified Bt maize on epigeic arthropods. Environ. Entomol 36 (4): 967-981 2007
77. Hasler M, Vonk R, Hothorn LA Assessing non-inferiority of a new treatment in a three-arm trial in the presence of heteroscedasticity. Statist. Med. 2008; 27:490–503
78. Braat S, Gerhard D, Hothorn LA. Joint one-sided and two-sided simultaneous confidence intervals. JOURNAL OF BIOPHARMACEUTICAL STATISTICS 18 (2008) 2: 293-306.
79. Froemke C, Hothorn LA Kropf S Nonparametric relevance-shifted multiple testing procedures for the analysis of high-dimensional multivariate data with small sample sizes. BMC Bioinformatics 2008, 9:54 doi:10.1186/1471-2105-9-54
80. Schunkert H , Gotz A,....Hothorn LA.: Repeated replication and a prospective meta-analysis of the association between chromosome 9p21.3 and coronary artery disease. CIRCULATION 117 (2008)13: 1675-1684.
81. **Hothorn, LA** and Hasler, M.: Proof of hazard and proof of safety in toxicological studies using simultaneous confidence intervals for differences and ratios to control. J. Biopharm Stat. (2008) 18: 915-933.
82. Schaarschmidt F, Sill M, Hothorn LA.: Poly-k-tend tests for survival adjusted analysis of tumor rates formulated as approximate multiple contrast test. J. Biopharm Stat. (2008) 18: 934-948
83. Dilba, G. and Hothorn L.A. and Tsong, Y.: Equivalence Tests for Shelf Life and Average Drug Content in Stability Studies J. Biopharm Stat. (2008) 18: 985 – 995.
84. Schaarschmidt F, Sill M, Hothorn LA. Approximate Simultaneous Confidence Intervals for Multiple Contrasts of Binomial Proportions. Biometr. J. (2008) 50: 782-792.
85. Hasler M, Hothorn LA: Multiple Contrast Tests in the Presence of Heteroscedasticity. Biometr. J. (2008) 50: 793-800.
86. **Hothorn, L.A.**, Gerhard, D.: Statistical evaluation of the in vivo micronucleus assay. Arch. Tox. 2009 (online Dec 2008) DOI:10.1007/s00204-008-0393-8
87. Djira, GD and Hothorn, LA. Detecting Relative Changes in Multiple Comparisons with an Overall Mean. J Quality Control 41 (2009)1, 60 – 65.
88. Schaarschmidt F, Biesheuvel, E., Hothorn LA.: Asymptotic Simultaneous Confidence Intervals for Many-to-One Comparisons of Binary Proportions in Randomized Clinical Trials Journal of Biopharmaceutical Statistics (2009) 19, 292 - 310
89. **Hothorn LA**, Vaeth M, Hothorn T.: Trend tests for the evaluation of exposure-response relationships in epidemiological exposure studies. Epidemiol Perspect Innov. 2009 Mar 6;6:1.
90. **Hothorn LA.**, Gerhard, D, Hofmann, M. Parametric and non-parametric prediction intervals based phase II control charts for repeated bioassay data. Biological 37 (2009) 323-330.
91. **Hothorn LA** , Hothorn, T. Order-restricted Scores Test for the Evaluation of Population based Case–control Studies when the Genetic Model is Unknown. Biometrical Journal 51 (2009) 4, 1–11 DOI: 10.1002/bimj.200800203.
92. Dette H, Trampisch M, Hothorn LA Robust Designs in Noninferiority Three-Arm Clinical Trials With Presence of Heteroscedasticity, Statistics in Biopharmaceutical Research. 2009, 1(3): 268-278. doi:10.1198/sbr.2009.0021.
93. Acutis, M, Hothorn, L McNicol J van der Voet, H. Statistical considerations for the safety evaluation of GMOs. EFSA Journal 2009; 1250: 1
94. **Hothorn LA** , Vohr, H.W. Statistical Evaluation of the Local Lymph Node Assay , Regulatory Toxicology and Pharmacology (2009) doi:10.1016/j.yrtph.2009.10.007
95. Gerhard D, Hothorn LA Rank Transformation in Haseman-Elston Regression Using Scores for Location-Scale Alternatives. Hum Hered 2010;69:143–151. DOI: 10.1159/000267994
96. Zimmermann H, Gerhard D, Dingermann T, Hothorn, LA: Statistical aspects of design and validation of microtitre-plate-based linear and non-linear parallel in vitro bioassays . BIOTECHNOLOGY JOURNAL 5 (2010) 62-74.
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98. **Hothorn, LA.**; Sill, Martin; and Schaarschmidt, Frank (2010): Evaluation of Incidence Rates in Pre-Clinical Studies Using a Williams-Type Procedure, The International Journal of Biostatistics: Vol. 6 : Iss. 1, Article 15.
99. Zimmermann H, Gerhard D, Hothorn LA, et al : An Alternative to Animal Experiments in the Quality Control of Erythropoietin. PHARMAZEUTISCHE INDUSTRIE 72 (2010) 708-712.
100. Zimmermann H, Gerhard D, Hothorn LA, et al. An Alternative to Animal Experiments in the Quality Control of Erythropoietin Part 2 . PHARMAZEUTISCHE INDUSTRIE (2010) 72; 5: 884-895.
101. **Hothorn, L.A.**, Djira, D A ratio-to-control Williams-type test for trend. Pharmaceutical Statistics (2010) DOI: 10.1002/pst.464
102. Hasler M, Hothorn LA: A Dunnett-Type Procedure for Multiple Endpoints. Inter.J Biostatist (2011)7,3.
103. Hirotsu C, Yamamoto S, and Hothorn LA Estimating the Dose-Response Pattern by the Maximal Contrast Type Test Approach. Statistics in Biopharm Res. 2011, 3,40-53.
104. Hoffmann S, Hothorn LA, Edler L, Kleensang A, Suzuki M, Phrakonkham P, Gerhard D. Two new approaches to improve the analysis of BALB/c 3T3 cell transformation assay data. Mutat Res. 2011 Dec 10.

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105. Senti et al. Intralymphatic immunotherapy for cat allergy 1 induces tolerance after only 2 three injections. J. Allergy Clin Immun (2012)129, 5, 1290-1296.
106. Konietschke, F; Libiger O, L.A. Hothorn. Nonparametric Evaluation of Quantitative Traits in Population-Based

Association Studies when the Genetic Model is Unknown. PLOS ONE 7(2): e31242.
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109. Hasler M, Hothorn LA: A multivariate Williams-type trend procedure. *Statistics in Biopharm Research* 4(2012) 57-65.
110. Konietschke, F; L.A. Hothorn Evaluation of toxicological studies using a non-parametric Shirley-type trend test for comparing several dose levels with a control group. *Statistics in Biopharm Research* 4(2012)14-27.
111. Herberich, E Hothorn LA (2012) Statistical evaluation of mortality in long-term carcinogenicity bioassays using a Williams-type procedure. *Regul Toxicol Pharmacol.* 2012 Jun 28;64(1):26-34
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116. Hasler M, Hothorn LA: Simultaneous confidence intervals on multivariate non-inferiority. *Statistics in Medicine* (2013) 32(10) 1720-1729 DOI: 10.1002/sim.5633
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120. **Hothorn LA.**, Reisinger, K., Wolf, Th., Poth, A. Fieblinger, D., Liebsch, M. Pirow, R. Statistical analysis of the hens egg test for micronucleus induction (HET-MN Assay). *Mutation Res* (2013) 757:68-78
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123. Herberich E, Hothorn LA A Maximum-Type Association Test for Censored Time-to-Event Data. *J Biomet Biostat* 2013, 4:5

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124. Kitsche A. ; Hothorn, L.A. Testing for qualitative interaction using ratios of treatment differences. *Statistics in Medicine* (2014) 33,9,1477-1489.
125. Jaki, Th. , Kitsche A. Hothorn, LA: Statistical evaluation of toxicological assay with zero or near-to-zero counts in the concurrent control. *J. Biostatistics* 11, Issue 1, Pages 1 - 32 (June 2014)
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129. Schaarschmidt F Hothorn LA Statistical Methods and Software for Validation Studies on New In Vitro Toxicity Assays. *ATLA* 2014, 42, 319-329.
130. **Hothorn LA** Statistical evaluation of toxicological bioassays –a review. *Tox Res.* 2014 DOI: 10.1039/c4tx00047a

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131. Konietzschke, F., Placzek, M., Schaarschmidt, F., Hothorn, L.A. nparcomp: An R Software Package for Nonparametric Multiple Comparisons and Simultaneous Confidence Intervals. *Journal of Statistical Software* March 2015, Volume 64, Issue 9
132. Schaarschmidt, F., Hofmann, M., Jaki, Th. et al.; Statistical approaches for the determination of cut points in anti-drug antibody bioassays *J. Immun. Meth.* 418(84-100) 2015
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2016

134. Pallmann, P. and Hothorn, L.A. (2016) Analysis of means (ANOM): a generalized approach using R. *Journal of Applied Statistics*. doi:10.1080/02664763.2015.1117584.
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136. Santiago, J. et al. Mechanistic insight into a peptide hormone signaling complex mediating floral organ abscission. *eLife* (2016) DOI: <http://dx.doi.org/10.7554/eLife.15075>
137. **Hothorn, L.A.** The two-step approach - a significant ANOVA F-test before Dunnett's comparisons against a control - is not recommended. *Commun Stat A* 2016().
138. Kitschke A. · Ritz C. · Hothorn L.A. A General Framework for the Evaluation of Genetic Association Studies Using Multiple Marginal Models. *Hum Hered* 2016;81:150-172 (DOI:10.1159/000448477)

Other publications:

- Hothorn L. *Experimental design and analysis in toxicology*. *Biometrics* 37 (1981) 605.
- Hothorn, L. *Multiple Mittelwertvergleiche in Dosis-Wirkungs-Abhängigkeiten*. *Sitzungsber. IG Math. Statist.* 9 (1984) 17-22.
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- Hothorn, L.: *Comparison of growth curves, with application in toxicology*. *Probl. angew. Statist.* 24 (1988) 119-126.
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- Volume 80 (1995), MMV Medizin Verlag München, S. 117-121.
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- Loley, Christina; Koenig, Inke R.; Hothorn, Ludwig; et al. Testing and genetic model selection in genome-wide association studies. *ANNALS OF HUMAN GENETICS* Volume: 76 Pages: 420-420 Part: Part 5 Published: SEP 2012.
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Guest Editor:

- Statistics in Toxicology. Drug Information J. 30 (1997)2. Papers from the DIA meeting held at Brugge (Belgium), 1995
- Multiple comparisons. Papers from the International Conference held at Tel Aviv University, Tel Aviv, June 1996. Edited by Yoav Benjamini, Ludwig Hothorn and Pranab K. Sen. J. Statist. Plann. Inference {82} (1999), no. 1-2. North-Holland Publishing Co., Amsterdam, 1999. pp. i-iv and 1--262.
- Multiple comparison procedures. Papers from the 2nd International Conference held at Berlin, June 2001. Edited by Peter Bauer, Ludwig Hothorn and Peter Westfall Biometrical Journal 43(2001) 553-663.

Book

- Ludwig A. Hothorn, Statistics in Toxicology Using R, December 21, 2015 by Chapman and Hall/CRC , ISBN 9781498701273 - CAT# K24557

Book chapters

- Horn, L. and Hothorn, L.: *Grundlagen der Statistik für Toxikologen*
- Probleme der Toxikologie Vol. 5, Verlag Volk und Gesundheit, Berlin (1990)
- Hothorn, L. (ed.): *Modern Statistical Methods in Toxicology*. Lecture Notes in Medical Informatics, Vol. 41 , Springer Verlag Heidelberg (1991)
- Adam, J., Hothorn, L. et al.: *Statistisches know how in der medizinischen Forschung*. Ullstein-Mosby Verlag Berlin (1992)
- Nagel, M. , Hothorn, L. and Hartmann, P.: *Hochinteraktive Datenanalyse- Werkzeuge und Prinzipien*. In: Methoden und Werkzeuge für die exploratorische Datenanalyse in den Biowissenschaften. G. Fischer, Stuttgart (1992) 75-91.
- Hothorn, L. und Nagel, M.: *Eine Software-Umgebung zur kombinierten exploratorischen und konfirmatorischen Datenanalyse bei multivariaten Fragestellungen in präklinischen und klinischen Studien*. In: Methoden und Werkzeuge für die exploratorische Datenanalyse in den Biowissenschaften. G. Fischer, Stuttgart (1992) 141-148.
- Hothorn, L.: *Sample size estimation for several trend tests in the k-sample problem*. In: Computational Statistics. (Ed.: Dodge, Y. and Whittaker, J.), Physica-Verlag Heidelberg, Vol. 2 (1992) 387-390.
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- Hothorn, L. A.: *Biostatistical analysis of the experimental design 'control versus k treatments' including a positive control group*. In: Vollmar, J. (ed.) *Biometrie in der chemisch-pharmazeutischen Industrie*, Volume 6 (1995), Fischer Verlag Stuttgart, 19-26.
- Ortseifen, C. und Hothorn, L. A.: *Multiple Vergleiche 'Kontrolle gegen k Behandlungen' bei Abweichung von den ANOVA-Annahmen*. In: Vollmar, J. (ed.) *Biometrie in der chemisch-pharmazeutischen Industrie*, Volume 6 (1995), Fischer Verlag Stuttgart, 77-100.
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- Vollmar, J; Hothorn LA (Eds.): *Cross-over clinical trials*. *Biometrics in the Pharmaceutical Industry*, Volume 7, Fischer Verlag Stuttgart (1997), 1-97.
- Hothorn, L. A.: *New statistical methods for analyzing mutagenicity assays: real data problems in biopharmaceutical drug development*. In: Kitsos, C.P.; Edler, L. (eds.): *Industrial statistics*. Physica Verlag Heidelberg (1997), 201-208
- Neuhäuser, M. and Hothorn, L.A.: *Adaptive tests for trend*. In: Kitsos, C.P.; Edler, L. (eds.): *Industrial statistics*. Physica Verlag Heidelberg (1997), 269-273.
- Hothorn, L.A., Hauschke, D., Senn S.J. and Lehmacher W.: *Cross-over trials: references of the last six years*. In: Vollmar, J; Hothorn LA (Eds.) *Cross-over clinical trials*. *Biometrics in the Pharmaceutical Industry*, Volume 7, Fischer Verlag Stuttgart (1997), 73-96.
- Hothorn, L.A., Hauschke, D., Senn S.J. and Lehmacher W.: *Pro's and con's of cross-over trials*. In: Vollmar, J; Hothorn LA (Eds.) *Cross-over clinical trials*. *Biometrics in the Pharmaceutical Industry*, Volume 7, Fischer Verlag Stuttgart (1997), 97.
- Hauschke, D. and Hothorn, L.A.: *Safety assessment in toxicology studies: proof of safety versus proof of hazard*. In: Chow, S.-C. and Liu, J.-P. (eds.): *Design and analysis of animal studies in pharmaceutical development*. Chapter 6. Marcel Dekker, New York (1998) p. 197-226
- Hothorn, L.A. and Hauschke, D.: *Statistical Testing Principles in Randomized Toxicological Studies*. In: Chow, S.-C. and Liu, J.-P. (eds.): *Design and analysis of animal studies in pharmaceutical development*. Chapter 4. Marcel Dekker, New York (1998) p. 79-134
- Rasch, D. et al. (eds.): *Verfahrensbibliothek Versuchsplanung und -auswertung*. Band II. Mitarbeit an mehreren Verfahren (Hothorn, L.A.). R. Oldenburg Verlag München (1998)
- Marquardt, H. und Schäfer, S.G.: *Textbook in Toxicology*. Darin: *Biostatistics*. Academic Press (1998)
- Bretz, F. and Hothorn, L.A. *Multiple comparisons in repeated measures designs, with biomedical applications*. In: *Mathematical Statistics with Applications in Biometry*. Festschrift in honour of S. Schach, eds. J. Kunert, G. Trenkler. J. Eul Verlag, Lohmar, 2001, 303-312.
- Marquardt, H. und Schäfer, S.G.: *Lehrbuch Toxikologie*. Darin: *Biostatistik*. Wissenschaftliche Verlagsgesellschaft (2003)
- Reichl FX, und Schwenk M: *Regulatorische Toxikologie*. Darin: 2.3.1 *Statistische Auswerteverfahren*. Springer Heidelberg 2004
- Dan Lin, Gemechis D. Djira, Ziv Shkedy, Tomasz Burzykowski und Ludwig A. Hothorn. *Simultaneous Inferences for Ratio Parameters Using Multiple Contrasts Test. Modeling Dose-Response Microarray Data in Early Drug Development Experiments Using R Use R!*, 2012, S 249-258, DOI: 10.1007/978-3-642-24007-2_16

- Dan Lin, Ludwig A. Hothorn, Gemechis D. Djira., Frank Bretz Multiple Contrasts Test for Testing Dose-Response under Order-Restricted Alternatives. In: Modeling Dose-Response Microarray Data in Early Drug Development Experiments Using R Use R!, 2012, S 233-248, DOI: 10.1007/978-3-642-24007-2_16
- Dan Lin, Daniel Yekutieli, Gemechis D. Djira., Ludwig A. Hothorn Multiple Confidence Intervals for Selected Ratio Parameters Adjusted for the False Coverage-Statement Rate. In: Modeling Dose-Response Microarray Data in Early Drug Development Experiments Using R Use R!, 2012, S 259-267, DOI: 10.1007/978-3-642-24007-2_16
- Marquardt, Hans; Schäfer, Siegfried G. ; Barth, Holger (Hrsg.) Lehrbuch der Toxikologie, Wiss. Verlagsgesellschaft Stuttgart3., vollständig überarbeitete und erweiterte Auflage 2013. ISBN 978-3-8047-2876-9 darin: . Darin: Biometrie
- Reichl, F.X. and Schwenk, M. (ed) Regulatory Toxicology. Chapter: Statistical Evaluation Methods in Toxicology. p.213-223.. Springer HD 2014

Meeting organizer/Member of program committee

- Annual meetings of the working group „Bioassay“, 1981-1988
- Congress of the Society of Biomathematics and Biophysics, Berlin, 1986
- EUROTOX' 90 Congress (Section Biostatistics), Leipzig, 1990
- Workshop "Biostatistical analysis of micronucleus assay,.. German Cancer Research Centre, 1991 (organizer)
- Annual meetings of the AG „Biostatistics of pre-clinic studies., 1991-1995 (organizer)
- DIA Meeting: Biostatistics in toxicology, Brugge, 1996 (organizer)
- International Meeting on Multiple Comparisons, Tel Aviv (member of organizing committee), 1996
- DIA Meeting: Pre-clinical statistics, Nice, 1998 (member of organizing committee)
- DIA Euro-workshop, Prague, 1999 (member of organizing committee)
- International workshop on multivariate distributions, Hannover (1998) (head of organizing committee)
- DIA Meeting: Pre-clinical statistics, Montreaux, 2000 (member of organizing committee)
- 2nd International Conference on Multiple Comparisons, Berlin (2000) (head of organizing committee)
- bmbf-Kolloquium "Biometrie in der biologischen Sicherheitsforschung", Hannover, 2002 (organizer)
- 3rd International Conference on Multiple Comparisons, Bethesda/USA (2002) (member of organizing committee)
- DIA Meeting: Pre-clinical statistics, Barcelona, 2002 (member of organizing committee)
- DIA Meeting: Pre-clinical statistics, Dublin, 2004 (member of organizing committee)
- DIA Euro Meeting, Nice, 2005 (member of organizing committee)
- International Conference on Nonclinical Statistics, Potsdam, 2006 (member of organizing committee)
- Summer school German Region IBS: Multiple tests and sim. confiden. intervals (St. Andreasberg), 2007 (organizer)
- International Conference on Nonclinical Statistics, Lyon 2010 (member program committee)
- 2nd International Conference on Biopharmaceutical Statistics, Berlin 2011 (member program committee)
- International Conference on Nonclinical Statistics, Potsdam 2012 (member program committee)
- International Conference on Simultaneous Inference, Hannover 2013 (head of organizing committee)

Editorial Duties

- Associate Editor Biometrical Journal (until 2008)
- Associate Editor Drug Information Journal (until 2005)

Journal Reviews

Annals of Applied Biology ; Biometrics; Biometrical Journal; Biometrika; Communications in Statistics; Computational Statistics and Data Analysis; Drug Information Journal; EDV in Medizin und Biologie; HortSci; International J. of Cancer; JABES. Int. J. Biostatistics; J. American Statistical Association; J. Biopharmaceutical Statistics; J. Statistical Computation and Simulation; J. Statistical Software; J. Statistical Planning Inference; Pharmaceutical Statistics, Probleme der angewandten Statistik; Plant Journal; Statistical Applications in Genetics and Molecular Biology Statistisches Archiv; Statistical Methods and Applications; Statistical Papers; Statistica Sinica; Statistics in Medicine; Trends in Pharmacological Sciences; Toxicology and several book reviews

Project Peer Reviewer

- DFG
- NSF
- OECD

Talks (since 2012)

- *Utrecht University Seminar January 2012 Multiple testing versus model selection procedures under order restriction*
- *Biometr. Kolloq Berlin 2012 Model selection procedures under order restriction- an alternative to related multiple test procedures?*

- *Nonclinical Statistics Conference Potsdam 09/2012* LOAEL Identification by Model Selection Procedures Under Order Restriction (with Kuiper and Gerhard)
- *Berliner Biometrische Kolloq (November 2012)* Auswertung toxikologischer Studien mit dem Williams-Trendtest für verschiedenste Endpunkte
- *University of Copenhagen (February 2013)* Multiplicity-adjusted p-values versus simultaneous confidence intervals- a biostatistical perspective
- *Nordic Biometric Conference Stockholm (June 2013)* What do the two different problems have in common? Identifying the best plant clone/mutant. Are Piedmont pupils better than others in CA? Multiple comparisons with the grand mean
- *MCP2013 (July 2013, Southampton)* MCP's for non-Gaussian distributed endpoints- using R
- *Medical University of Vienna (October 2013)* User-defined contrasts within multiple contrast tests- case studies using R
- *Styer Biometric Section, Graz (October 2013)* Multiple comparisons for non-Gaussian endpoints-using R
- *Paris-Lodron Universität Salzburg (Januar 2014)* Multiple testing by multiple contrasts
- *EIP Conference Lisboa (February 2014)* Cutpoint estimation assuming a mixing distribution within the mixed model
- *University of Bremen (July 2014)* Order restricted inference: multiple contrast tests vs. model selection
- *Nonclinical Statistics Conference Brugge (October 2014)* ADA Cutpoint estimation using R: assumptions, solutions and problems
- *Medical University of Vienna (November 2014)* Quality ranking
- *Nordic Biometric Conference Reykjavik (June 2015)* Overview on different multiplicity adjustments- using R
- *Wiener Biometrische Sektion. Medical University of Vienna (November 2015)* Simultaneous inference using multiple marginal models
- *Dagstat Göttingen (March 2016)* Simultaneous testing on different factors/ covariates: from Bonferroni inequality to multiple marginal models
- *Agrostat Lausanne (March 2016)* Proof of safety for a new variety/ product relative to a common-used one for multiple endpoints
- *Nonclinical Statistics Conference Cambridge, UK (October 2016)* Tutorial Dose-response analysis considering dose both as qualitative factor and as quantitative covariate
- *Internat Workshop on Multiple marginal Models (Hannover (December 2016)* Multiple, different-scaled, endpoints
- *Berlin Biostatistics Workshop (December 2016)* Simultane und selektive Inferenz-Ausweg aus dem p-Wert Dilemma?

Supervision of thesis

- H.-F. Koch (1996) *Teststrategien für die „many-to-one“ Versuchsanlage im Falle dichotomer Ereignisse* . Dissertation Universität Hannover (1)
- M. Neuhäuser (1996) *Trendtests bei a priori unbekanntem Erwartungswertprofil*. Dissertation Universität Dortmund
- B. Brandt (1996) *Trendtests für location-scale Alternativen*. Dissertation Universität Hannover (3)
- M. Reit (1998) *Internetbasierte Lernsysteme zur Unterstützung der biostatistischen Ausbildung im Gartenbau*. Diplomarbeit Universität Hannover.
- M. Krämer (1998) *Multiple Vergleichsverfahren in ausgewählten gartenbaulichen Versuchen*. Diplomarbeit Universität Hannover
- F. Bretz (1999) *Powerful modification of Williams' test on trend*. Dissertation Universität Hannover (4)
- D. Hauschke (1999) *Statistische Aspekte von Sicherheitsstudien*. Habilitationsschrift, Universität Dortmund
- M. Weichert (2000) *Robuste Mittelwertvergleiche mit gartenbaulichen Anwendungen*. Dissertation Universität Hannover (5)
- D. Seidel (2000) *Trendtest für geordnet kategoriale Daten bei sehr kleinen Fallzahlen*. Dissertation Universität Hannover (6)
- C. Schratz (2001) *Simultaneous tests and confidence intervals for experimental agriculture designs*. Diplomarbeit Universität Hannover
- D. Gehrling (2002) *Biostatistische Methoden zur Schätzung des Stichprobenumfangs bei der Qualitätskontrolle von Saatgut*. Diplomarbeit Universität Hannover
- E. Biesheuvel (2002) *Many-to-one comparisons in stratified designs*. Dissertation Universität Hannover (7)
- R. Westphal (2002) *Nichtparametrische multiple Kontrasttests für rechtszensierte Daten in klinischen Dosisfindungsstudien*. Diplomarbeit Universität Dortmund
- A. Baumgart (2002) *Fallzahlbestimmung und Versuchsplanung für ausgewählte gartenbauliche Anlagen* (Diploma Thesis University of Hannover, 2002)
- D. Ma (2004) *Small Sample inference for the two-sample design*. (Master thesis, University of Hannover 2004)
- F. Schaarschmidt (2005) *Binomial group testing – Design and Analysis* (Diploma Thesis University of Hannover, 2005) (8)
- G. Dilba (2005) *Simultaneous Inference for Ratios of Location Parameters*. Dissertation Universität Hannover (9)
- C. Frömke (2005) *Relevance shifted tests for high dimensional data with small sample sizes*. Dissertation Universität Hannover (10)
- D. Gerhard (2006) *Poisson confidence intervals for testing the equality of abundance data in generalized linear models* (Diploma Thesis)
- M. Sill (2007) *Approximate confidence intervals and tests for binomial proportions and poly-k estimates* Msc Thesis Leibniz Universität Hannover

- Menke, S. (2007) *Einfluss von Neem Azal-U und Neem-Pellet auf Trialeurodes vaporariorum und Encarsia Formosa unter besonderer Berücksichtigung der biostatistischen Bewertung der Versuchsdaten mittels Generalisierter Linearer Modelle*. Msc Thesis Leibniz Universität Hannover
- F. Schaarschmidt (2008) *Marginal and simultaneous confidence intervals for abundance data with applications to safety assessment of non-target species*. Dissertation Leibniz Universität Hannover (11)
- M. Hasler (2009) *Extensions of multiple contrast tests*. Dissertation Leibniz Universität Hannover (12)
- X. Mi (2009) *Model Selection Procedure with Familywise Error Rate Control for Binomial Order-Restricted Problems*. Dissertation Leibniz Universität Hannover (13)
- J. Kruppa (2009) *Simultaneous confidence intervals for fixed effect parameters in a linear mixed model*. Msc Thesis Leibniz Universität Hannover
- A. Kitsche (2010) *Incorporation of historical data in the statistical analysis of toxicological bioassays*. Msc Thesis Leibniz Universität Hannover
- Schmidt, M. (2010) *"Multiple comparisons of populations based on genetic marker data"* M.Sc. Thesis
- D. Gerhard (2010) *Simultaneous small sample inference based on profile likelihood* Dissertation Leibniz Universität Hannover (14)
- Scherer, R. (2010) *"Simultaneous Confidence Intervals for Biodiversity Indices with Application to Overdispersed Multinomial Count Data"* M.Sc. Thesis,
- M. Sprengel (2012) *Analyse kategorialer Daten mit speziellen Focus auf simultane Konfidenzintervalle*; Msc Thesis Leibniz Universität Hannover
- P. Pallmann (2012) *Two-sample tests and multiple contrast tests of several diversity indices* Msc Thesis Leibniz Universität Hannover
- A. Garder (2013) *Application of model selection procedures in order-restricted B-spline regression models*. Msc Thesis Leibniz Universität Hannover
- A. Kitsche (2014) *Evaluation of interaction effects in two-factorial designs by simultaneous confidence intervals in the cell means model*. Dissertation Leibniz Universität Hannover (15)
- P. Pallmann (2016) *Multiple Contrast Tests with Repeated and Multiple Endpoints, with Biological Applications*. Dissertation Leibniz Universität Hannover (16)

Funded research projects

- 1995-1998 *Analysis of score data (Bonituren) in dose-response studies on herbicides* (BASF AG)
- 1997-1998 *The relevance of simple potency grading in carcinogenic classification based on animal data* (Federal Ministry of Health, bgvv)
- 1998 *Stratified trend tests for dichotomous endpoints* (Sabbatical University of California at San Francisco) (Volkswagenstiftung Hannover)
- 2000 *Validation and interlaboratory comparison of an immunotoxicity study* (Federal Ministry of Health, bgvv)
- 2001 *Sub-group analysis with error control*. (Solvay Corp. Weesp, The Netherlands)
- 2001 *Statistical methods for the purity proof against GMO's* (KWS AG, Einbeck)
- 2001-2002 *Statistical analysis of in-vitro validation studies INVITROSTAT* (European Community, Research Centre Ispra, Italy, Contract no. 17159-2000-11F1ED ISP DE , project leader)
- 2002-2005 *Simultaneous inference for ratio's* (DFG, No. BR2002/1)
- 2003 *Trend test for exposure studies* (VW-Stiftung for sabbatical stay at University of Aarhus)
- 2004 International Biometric Society Council, Cairns Australia (sponsored by DFG)
- 2005 - 2008 *Biometrische Methoden zum quantitativen Sicherheitsnachweis für Nichtzielorganismen, Resistenzfaktoren sowie spezifische Inhaltsstoffe beim Anbau gentechnisch veränderter Pflanzen im Freilandversuch* (Federal Ministry of Education and Research, bmbf)
- 2006 *Panel member on food additives, flavourings, processing aids and materials in contact with food (AFC) – working group on Aspartame* (European Food Safety Authority, Parma, Italy)
- 2007 EU-project: ECVAM JRC April "Quality assessment and novel statistical analysis techniques for toxicological data" ; Lot 2: ANOVA technique for ratios , No. 2006/S 237-252824
- 2008 - 2014 EU project No.201619 "ESNATS—Embryonic Stem cell-based Novel Alternative Testing Strategies" (FP7-HEALTH-2007-A) Part LUH Institute of Biostatistics
- 2010-2014 DfG Projekt (DfG HO168719)"Simultane Konfidenzintervalle für nichtparametrische Effekte in faktoriellen Modellen"