

**ANDERS HALLBERG CURRICULUM VITAE AND PUBLICATIONS (>290)**

Address: Department of Medicinal Chemistry, BMC, Box 574, SE-751 23 Uppsala  
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BORN: April 29, 1945      NATIONALITY: Swedish

**A. Professional preparation**

Military service (15 months, infantry sergeant)	I 12 Eksjö	1965
Master of Science (MSc, chemistry/physics)	Lund University	1969
Specialist teacher (BScEd, <i>ämneslärarexamen</i> )	School of Education, Malmö	1970
Doctor of Philosophy (PhD, organic chemistry)	Lund University	1980
Docent (organic chemistry)	Lund University	1983

**B. Appointments**

Teacher/Musician	Southern Sweden	1969-72
Assistant Research Fellow	Chemical Center, Lund University	1973-79
Research Scientist (6 months)	Nobel Kemi, Karlskoga	1980
Research Associate (6 months, pharmacy)	University of Arizona, Tucson	1980
Assistant Professor (pharmacy)	University of Arizona, Tucson	1981-82
Associate Professor ( <i>forskare</i> , VR grant)	Chemical Center, Lund University	1983-86
Associate Director	Astra, Lund	1986-88
Director, Head Medicinal Chemistry	Astra, Lund	1988-90
Professor (and <i>em</i> ) in Medicinal Chemistry	Uppsala University	1990-
Head ( <i>prefekt</i> ), Dept of Org Pharm Chemistry	Uppsala University	1991-96
Dean for Research, Faculty of Pharmacy	Uppsala University	1996-02
Deputy Vice President (Medicine/Pharmacy)	Uppsala University	2002-05
Dean Faculty of Pharmacy	Uppsala University	2005-06
Vice-Chancellor / President / <i>Rector Magnificus</i>	Uppsala University	2006-11

**C. Miscellaneous**

Chairman of the Medicinal Chemistry Section, Swedish Academy of Pharmaceutical Sciences	1992-97
Vice Chairman of the Board of the Faculties of Medicine and Pharmacy	2002-05
Member of the Board of <i>Carolina Rediviva</i> , the Uppsala University Library	2002-05
Member of the Board of Laboratory Animal Resources at Uppsala University	2004-05
Chairman of the Steering Committee MedFarm DoIT	2003-05
Member of the Board of Uppsala University Holding Company	2005-06
Member of the Chemistry Evaluation Committee, The Swedish Research Council (VR)	1997-00
Member of the Chemistry Steering Committee, The Swedish Research Council (VR)	1998-00
Chairman of the Evaluation Panel F (chemistry), The Swedish Research Council (VR)	2001-05
Member of the Board, Akademiförvaltningen (University Fund Management), Uppsala	2006-11
Member of the County Administrative Board, Uppsala County	2007-11
Chairman of the Göran Gustavsson Foundation	2010-11
Member of Forskningsberedningen (Scientific Advisory Board of the Government)	2011-14
Member of the Board of the Foundation for Baltic and East European Studies	2012-16
Member of the Board of Åbo Akademi University, Åbo, Finland	2009-17
Member of the Board of Medivir AB	2012-19
Member of the Board of the Beijer Foundation	2012-23
Member of the Board of Gothenburg University	2017-23
Member of the Royal Society of Sciences in Uppsala (Preses 2014-15)	1994-
Elected Honorary Member of the Royal Society of Sciences in Uppsala	2023-
Member of the Royal Society of Arts and Sciences in Uppsala	2004-
Member of the Royal Physiographic Society in Lund	2005-
Member of the Royal Swedish Academy of Sciences (KVA) Class IV, chemistry	2006-
Member of the Royal Swedish Academy of Engineering Sciences (IVA) Class IV, chemistry	2007-

Member of the Royal Patriotic Society	2009-
Member of Societas Intellectualis Seniorum Upsaliensis (SISU)	2015-
Section Editor, <i>European Journal of Pharmaceutical Sciences</i>	1998-05
The Fabian Gyllenberg Award from the Royal Physiographic Society in Lund, for best PhD thesis in chemistry (over a three year period) at Lund University	1981
Senior Individual Grant Award to Outstanding Senior Scientist (SSF)	1998
First recipient of the National Swedish Prize in Organic Chemistry (The Holmquist Prize)	2004
The Oscar Carlsson Medal for Excellence from the Swedish Chemical Society	2005
The Rudbeck Medal for Outstanding Achievements in Science from Uppsala University	2013
The Best Teacher Prize 2006 from the Pharmacy Student Union, Uppsala University	2006
H. M. the King's Medal, 12 <sup>th</sup> size with the ribbon of the Order of the Seraphim, for Distinguished Achievements in Education and Research	2008
The Order of the Cross of <i>Terra Mariana</i> from the President of Estonia	2011
The Gustav Adolf Medal (of the year 1924) from Uppsala University	2011
The Honorary Medal (Förtjänstmedaljen) of Kuratorskonventet from <i>Curator curatorum</i>	2011
The Honorary Medal of the Uppsala County (Förtjänstmedaljen) from the Governor	2011
<i>Doctor honoris causa</i> (Medicine), Université de Sherbrooke, Canada	2009
<i>Doctor honoris causa</i> (Pharmacy), Uppsala University	2014
<i>Doctor honoris causa</i> (Science and Technology), Åbo Akademi University, Finland	2018
<i>Doctor honoris causa</i> (Medicine), Hallym University, South Korea	2019
Honorary Member of the Småland Student Nation in Uppsala	
Honorary Member of the Upland Student Nation in Uppsala	
Honorary Member of the Gotland Student Nation in Uppsala	
Honorary Member of Allmänna Sången	
Honorary Member of Uppsala University Jazz Orchestra	
Honorary Member of Orphei Drängar (OD)	
Honorary Member of the Royal Academic Orchestra	
Honorary Member Rotary International	
Scientific Adviser AstraZeneca Lund (10-15%)	1990-99
Scientific Adviser AstraZeneca Mölndal (10-15%)	2000-06

Served as Member of the Board, Member of the Scientific Advisory Board or as Scientific Adviser at a number of Small and Medium-sized Enterprises: Albireo Pharma AB, Aprea AB (Karolinska Development), Biolipox AB (now Orexo), Medivir AB, Melacure AB, Neuronova AB, Labwell/Personal Chemistry AB (now Biotage), Softcure AB (founder), Uppsala Medicinal Chemistry AB (founder), Vicore Pharma AB (founder, Nasdaq listed).

> 290 publications; > 40 patents/patent applications; inventor of Candidate Drugs evaluated in clinical trials. H-index > 55 (Web of Science); sum of times cited without self-citations >10 000. D-index > 65.

#### D. PhD student supervision

PhD students (*huvudhandledare*) and year of degree: Kostas Karabelas, 1988; Carl-Magnus Andersson, 1988; Kristina Nilsson, 1990; Mats Larhed, 1997; Lena Ripa, 1997; Johan Hultén, 1999; Susanna Lindman, 2001; Kristofer Olofsson, 2001; Mathias Alterman, 2001; Malin Graffner-Nordberg, 2001; Petra Johannesson, 2002; Daniel Nöteberg, 2003; Anja Johansson (Sandström), 2003; Karl S. A. Vallin, 2003; Peter Nilsson, 2003; Ulrika Rosenström, 2004; Karolina Ersmark, 2005; Johan Wannberg, 2005; Anna Ax, 2005; Anna Arefalk, 2005; Jennie Georgsson, 2006; Jenny Ekegren, 2006; Per-Anders Enquist, 2006; Robert Rönn, 2007; Charlotta Wallinder, 2008; Gopal Datta, 2008; Kristina Orrling, 2009; Johanna Nurbo, 2010; Hanna Andersson, 2010.

## E. Research interests

The research interests encompass a range of protein targets of pharmaceutical relevance, including proteases and G-protein coupled receptors (GPCRs). One of the primary themes is to identify novel and selective low molecular weight ligands for these targets. New strategies are developed for both the design and for the synthesis of small, drug-like molecules. Lead compounds are optimized using computer-aided techniques and are preferentially synthesized using high-speed chemistry and new efficient transition metal-catalyzed reactions developed in our laboratory. Considerable efforts have in particular been devoted to the development of new robust and useful palladium-catalyzed C-C bond forming reactions. Major indications that are addressed are viral infections caused by HIV and HCV (Hepatitis C Virus). The HCV NS3 protease inhibitor simeprevir (Olysio) launched in US (2013), Japan (2013) and EU (2014) by Medivir/Johnson&Johnson (J&J) originates in part from our research, in close collaboration with Medivir AB, in Sweden. Today, the major focus of the Drug Discovery program is to identify novel ligands that interfere with protein targets in the renin/angiotensin system. The first reported drug-like selective and potent angiotensin II, type II receptor (AT2R) agonist (C21) was discovered by our group. Compound C21, (INN name; buloxibutid) now owned by Vicore Pharma AB (founded by AH *et al.*, listed at Nasdaq) has been extensively studied and is currently undergoing clinical evaluations (Phase II) with first indication idiopathic pulmonary fibrosis.

## F. Publications

1. S. Gronowitz, A. Hallberg: On the reaction of 4-(2'-furyl)pyrimidine with nitric acid in acetic anhydride-acetic acid.  
Acta Chem Scand 21 (1967) 2296-2298
2. S. Gronowitz, A. Hallberg, S. Liljefors, U. Forsgren, B. Sjöberg, S. E. Westerbergh: Nitro derivatives of mixed biheterocyclics with antibacterial activity.  
Acta Pharm Suecica 5 (1968) 163-176
3. S. Liljefors, A. Hallberg: Synthesis of a 1,3-dicarbonyl equivalent via Vilsmeier formylation of  $\alpha$ -enamino esters.  
Tetrahedron Letters 46 (1978) 4573-4574
4. A. Hallberg, T. Frejd, S. Gronowitz: Ring-opening reactions XIV. Organolithium-induced ring-opening of 3,4-dichloro-2,5-dimethoxythiophene.  
Chemica Scripta 13 (1978-79) 186-188
5. S. Gronowitz, A. Hallberg, T. Frejd: Ring-opening reactions XV. The reaction of some 2,5-disubstituted selenophenes with butyl- and phenyllithium.  
Tetrahedron 35 (1979) 2607-2610
6. A. Hallberg: Methoxythiophenes and related systems. Syntheses and reactions with organolithium reagents.  
Ph.D Thesis, Lund 1980
7. S. Gronowitz, A. Hallberg, C. Glennow: On the reaction of methoxide ion with bromiodothiophenes.  
J Heterocycl Chem 17 (1980) 171-174
8. A. Hallberg, T. Frejd, S. Gronowitz: Ring-opening reactions XVI. Ring-opening of 2,5-dimethoxy-3-thienyl-lithium and some related compounds.  
J Chem Soc Perkin 1 (1980) 1390-1392
9. S. Gronowitz, A. Hallberg, T. Frejd: Ring-opening reactions XVII. On the reaction of 2-chloro-2-methoxythiophenes and its bromoderivatives with butyllithium.  
Chemica Scripta 15 (1980) 1-3

10. A. Hallberg, S. Gronowitz: On the reaction of some thienyllithium derivatives with 1-chloro-2-dimethylaminoethane.  
*Chemica Scripta* 16 (1980) 42-46
11. A. Hallberg, S. Gronowitz: On the Vilsmeier formylation of some methoxythiophenes  
*Chemica Scripta* 16 (1980) 38-41
12. A. Hallberg, S. Liljefors, P Pedaja: A simplified synthesis of 3-bromoselenophene and some 3-bromothiophenes.  
*Synth Comm* 11 (1981) 25-28
13. A. Hallberg, L. Westfelt, B. Holm: Palladium-catalyzed arylation of alkyl vinyl ether.  
*J Org Chem* 46 (1981) 5414-5415
14. A. Hallberg, A. R. Martin: Indolo[1,7-ab][1]benzazepine, a new  $18\pi$ -electron heterocycle.  
*J Heterocycl Chem* 18 (1981) 1255-1256
15. A. Hallberg, D.R. Deardorff, A. Martin: A modified Bischler synthesis of some tetracyclic indole derivatives.  
*Heterocycles* 19 (1982) 75-82
16. A. Hallberg, A. Martin: Acylations of 1,10-dilithiophenothiazine. A new synthesis of 1-formylphenothiazine.  
*J Heterocycl Chem* 19 (1982) 433-435
17. J.O. Karlsson, S. Gronowitz, A. Hallberg: Organolithium-induced ring-opening of 3-halo-2,5-dimethylthiophene-1,1-dioxides.  
*Acta Chem Scand B* 36 (1982) 341-342
18. J.O. Karlsson, S. Gronowitz, A. Hallberg: Studies of the reaction of 2,5-disubstituted 3-bromothiophene-1,1-dioxides with some organolithium reagents.  
*Chemica Scripta* 20 (1982) 37-41
19. A. Hallberg, C. Westerlund: Styrene derivatives via palladium-catalyzed vinylation of aryl iodides.  
*Chem Lett* (1982) 1993-1994
20. T. Dahlgren, A. Hallberg, A. Martin: 1,10-Dideuteropyrrolo[3,2,1-kl]phenothiazine. In *Procedures for the synthesis of isotopically labeled intermediates, adjunct to the International Symposium on the Synthesis of Isotopically Labeled Compounds, Kansas City, MO* (1982) 68-69
21. A. Hallberg, P. Pedaja: Novel synthesis of some tricyclic ketones via lithium di-isopropylamide-mediated cyclization of 2-o-carboxy phenyl ethenylfurans, thiophenes, and selenophenes.  
*Tetrahedron* 39 (1983) 819-821
22. A. Hallberg, A. Martin, T. Dahlgren, K. Christiansen: Total assignment of the  $^1\text{H}$  NMR spectra of 5H-indolo[1,7-ab][1]benzazepine, 6,7-dihydro-5H-indolo[1,7-ab][1]benzazepine and pyrrolo[3,2,1-kl]phenothiazine.  
*J Heterocycl Chem* 20 (1983) 37-40
23. T. Dahlgren, A. Hallberg, R. Helitzer, A. R Martin: Metallations of 5H-dibenz[b,f]azepine and 10,11-dihydro 5H-dibenz[b,f]azepine. Synthesis of 4-substituted derivatives.  
*J Heterocycl Chem* 20 (1983) 341-343
24. T. Dahlgren, A. Hallberg, A. R. Martin: Tetracyclic phenothiazines. Lithiation of pyrrolo[3,2,1-kl]phenothiazine.  
*Heterocycles* 20 (1983) 33-38

25. A. Hallberg, C. Westerlund: On the reaction of phenyl organometallics with cyclic  $\alpha$ -methylene ketones.  
Chemica Scripta 22 (1983) 51-52
26. L.C. Vishwakarma, A. Hallberg, T. Dahlgren och A. R. Martin: Mass spectral fragmentation patterns of heterocycles IV. Tetracyclic phenothiazines. Electron impact promoted mass spectral fragmentation of pyrrolo[3,2,1-kl]phenothiazine.  
J Heterocycl Chem 20 (1983) 995-998
27. L.C. Vishwakarma, A. Hallberg, A. R. Martin: Mass spectral fragmentation patterns of heterocycles V. Electron impact promoted mass spectral fragmentation of 5H-indolo-[1,7-a,b][1]benzazepine and some of its derivatives.  
J Heterocycl Chem 20 (1983) 1199-1205
28. A. Hallberg, I. Al-Showaier, A. R. Martin: On the assignment of the  $^{13}\text{C}$  NMR spectrum of phenothiazine.  
J Heterocycl Chem 20 (1983) 1435-1436
29. A. Hallberg, A. R. Martin: A new synthesis of 1-chlorophenothiazine.  
Synth Comm 13 (1983) 467-470
30. A. Svensson, J.O. Karlsson, A. Hallberg: Aspects of the preparation of cyclohexenyl- and menthenyl thioenynes via ring-opening of thiophenes.  
J Heterocycl Chem 20 (1983) 729-734
31. A. Hallberg, I. Al-Showaier, A. R. Martin: The assignment of the  $^1\text{H}$  NMR and  $^{13}\text{C}$  NMR spectra of 5H-dibenz[b,f]azepine and 10,11-dihydro-5H-dibenz[b,f]azepine.  
J Heterocycl Chem 21 (1984) 197-199
32. A. Hallberg, A. R. Martin: Mass spectral fragmentation patterns of heterocycles VI. Carbazole and 1,8-dideuteriocarbazole.  
J Heterocycl Chem 21 (1984) 837-840
33. J. Alvhäll, S. Gronowitz, A. Hallberg, R. Svenson: Hydrozirconation of unsaturated fatty acid derivatives.  
J Am Oil Chem Soc 61 (1984) 430-436
34. J. Alvhäll, S. Gronowitz, A. Hallberg, R. Svenson: Hydrozirconation of oleic acid oxazoline followed by reaction with deuterium oxide.  
Chemica Scripta 23 (1984) 207-208
35. A. Hallberg, I. Al-Showaier, A. R. Martin: Mass spectral fragmentation patterns of heterocycles VII. Reinvestigation of the fundamental processes in phenothiazines.  
J Heterocycl Chem 21 (1984) 841-844
36. J. Alvhäll, S. Gronowitz, A. Hallberg, R. Svenson: On the hydrozirconation of 4,4-dimethyl-2-oxazolines of some  $\alpha,\beta$ -,  $\beta,\gamma$ - and  $\gamma,\delta$ -unsaturated fatty acids.  
Chemica Scripta 24 (1984) 170-177
37. A. Hallberg, A. R. Martin, G.E. Martin, G. Grönberg: Total assignment of the  $^{13}\text{C}$ -NMR spectra of 5H-indolo-[1,7-ab][1]-benzazepine and 6,7-dihydro-5H-indolo[1,7-ab][1] benzazepine using two-dimensional proton-carbon chemical shift correlation experiments.  
J Heterocycl Chem 21 (1984) 1893-1895
38. A. Hallberg, N. M. Hintermeister, A. R. Martin, R. B. Bates, R. B. Ortega: 4-Chloro-5-(3-dimethylaminopropyl)-10,11-dihydro-5H-dibenz[b,f]-azepine hydrochloride (4-Chloroimipramine hydrochloride),  $\text{C}_{19}\text{H}_{23}\text{ClN}_2\cdot\text{HCl}$ .  
Acta Cryst C 40 (1984) 2110-2112

39. A. R. Martin, A. Hallberg, T. H. Kramer, A. Svensson, R. B. Bates. R. B. Ortega: 1-Chloro-10-(3-dimethylaminopropyl)phenothiazine hydrobromide (1-Chloropromazine hydrobromide),  $C_{17}H_{19}ClN_2S.HBr$ .  
*Acta Cryst C* 40 (1984) 2113-2116
40. A. Hallberg, L. Westfelt: Palladium on charcoal-catalyzed arylation of methyl vinyl ether with 4-bromonitrobenzene.  
*J Chem Soc Perkin 1* (1984) 933-935
41. R. B. Bates, K. A. Christensen, A. Hallberg, R. E. Klenck, A. R. Martin: Solid and liquid-phase photodimerizations of 5H-indolo[1,7-ab][1] benzazepine.  
*J Org Chem* 49 (1984) 2978-2981
42. A. Hallberg, P. Dunbar, N. Hintermeister, A. Svensson och A.R. Martin: 1,2-Didehydrophenothiazines. Preparation of 1-alkyl- and 1-aryl-substituted phenothiazines by lithium-directed alkylation.  
*J Chem Soc Perkin 1* (1985) 969-971
43. A. Hallberg, L. Westfelt, C.-M. Andersson: A new route to 4-(2-methoxyethyl) phenol via palladium-catalyzed arylation of methyl vinyl ether.  
*Synth Comm* 15 (1985) 1131-1136
44. K. Karabelas, A. Hallberg: Palladium-catalysed arylation of vinyltrimethylsilane in the presence of silver nitrate.  
*Tetrahedron Letters* 26 (1985) 3131-3132
45. C.-M. Andersson, K. Karabelas, A. Hallberg, C. Andersson: Palladium/phosphinated polystyrene as catalyst in the Heck arylation. A comparative study.  
*J Org Chem* 50 (1985) 3891-3895
46. K. Karabelas, C. Westerlund, A. Hallberg: The effect of added silver nitrate on the palladium-catalyzed arylation of allyltrimethylsilanes.  
*J Org Chem* 50 (1985) 3896-3900
47. T. Klingstedt, A. Hallberg, P. Dunbar, A. Martin: Preparation of pyrrolo[3,2,1-jk]carbazole by nickel(0)mediated ring contraction of pyrrolo[3,2,1-kl]phenothiazine. Proton NMR and mass spectral studies.  
*J Heterocycl Chem* 22 (1985) 1547-1550
48. J. Alvhäll, S. Gronowitz, A. Hallberg: On the synthesis of  $\omega$ -bromo-fatty acid derivatives from internal unsaturated acids.  
*Chemica Scripta* 25 (1985) 393-397
49. I. Al-Showaier, A. Hallberg, K. H. Schram, A. Martin: Mass spectral fragmentation patterns of heterocycles, IX. Investigation of the fundamental processes in 5H-dibenz[bf]azepines and dihydro-5H-dibenz[b,f]azepines.  
*J Heterocycl Chem* 23 (1986) 731-736
50. A. Hallberg, A. Svensson, A. Martin: An intramolecular anionic Fries rearrangement of N-acyl-phenothiazines.  
*Tetrahedron Letters* 27 (1986) 1959-1962
51. P. Pedaja, C. Westerlund, A. Hallberg: An approach to tetrahydrobenz[b,d]pyrans and hexahydrophenantridines by reaction of dilithiated phenol and aniline with pulegone.  
*J Heterocycl Chem* 23 (1986) 1353-1354
52. K. Karabelas, A. Hallberg: Synthesis of (E)-(2-arylethenyl)silanes by palladium-catalyzed arylation of vinylsilanes in the presence of silver nitrate.  
*J Org Chem* 51 (1986) 5286-5290

53. S. Gronowitz, G. Nikitidis, A. Hallberg, C. Stålhandske: On the reaction of 3,4-dibromo-2,5-dimethylthiophene-1,1-dioxide with piperidine. X-Ray structure determination of 3-bromo-2-methyl-4-piperidino-5-piperidinomethyl-cis-4,5-dihydrothiophene-1,1-dioxide. *Acta Chem Scand B41* (1987) 297-301
54. U. Annby, S. Gronowitz, A. Hallberg: On the hydrozirconation of some tertiary 9-Z-octadecenylamines and related compounds. *Chemica Scripta* 27 (1987) 445-452
55. S. Gronowitz, A. Hallberg, G. Nikitidis: A stereoselective synthesis of dialkylaminomethyl-substituted halobutadienes via amine-induced ring-opening of thiophene-1,1-dioxides. *Tetrahedron* 43 (1987) 4793-4802
56. C.-M. Andersson, A. Hallberg: A regiospecific benzylation of alkyl vinyl ethers catalyzed by palladium. *Tetrahedron Letters* 28 (1987) 4215-4216
57. K. Nilsson, A. Hallberg: A study of allylboronate as substrate in palladium-mediated arylation. *Acta Chem Scand B41* (1987) 569-576
58. C.-M. Andersson, A. Hallberg, G. D. Daves Jr.: Regiochemistry of palladium-catalyzed arylation reactions of enol ethers. Electronic control of selection for  $\alpha$  or  $\beta$  arylation. *J Org Chem* 52 (1987) 3529-3536
59. S. Karlsson, A. Hallberg, S. Gronowitz: On the hydrozirconation of oleyl ethers. *Chemica Scripta* 28 (1988) 185-189
60. J. Alvhäll, S. Gronowitz, A. Hallberg: New modified hydrozirconation/isomerization reagents. *Chemica Scripta* 28 (1988) 285-288
61. S. Gronowitz, G. Nikitidis, A. Hallberg: On the reaction of some dimethylthiophene-1,1-dioxides with thiolates and alkoxides. *Chemica Scripta* 28 (1988) 289-293
62. C.-M. Andersson, A. Hallberg: Synthesis of  $\beta$ -arylvinyl ethers by the palladium-catalyzed reaction of aroyl chlorides with vinyl ethers. *J Org Chem* 53 (1988) 235-239
63. C.-M. Andersson, A. Hallberg: Regioselective palladium-catalyzed arylation of vinyl ethers with 4-nitrophenyl triflate. Control by addition of halide ions. *J Org Chem* 53 (1988) 2112-2114
64. S. Gronowitz, G. Nikitidis, A. Hallberg, R. Servin: A new synthesis of pentasubstituted benzenes by tandem dimerization-ring-opening of 3-halo-2,5-dialkylthiophene-1,1-dioxides. *J Org Chem* 53 (1988) 3351-3353
65. C.-M. Andersson, A. Hallberg: Palladium-catalyzed arylation of alkyl vinyl ethers. An entry to monoprotected 1-aryl-1,3-dicarbonyl equivalents. *J Org Chem* 53 (1988) 4257-4261
66. K. Karabelas, A. Hallberg: Synthesis of 1-trimethylsilyl-1,3-dienes by the palladium-catalyzed reaction of trimethylvinylsilane with vinyl iodides/silver nitrate or vinyl triflate. *J Org Chem* 53 (1988) 4909-4914
67. U. Annby, S. Gronowitz, A. Hallberg: Hydrozirconation of 1-arylalkenes. *J Organomet Chem* 365 (1989) 233-242
68. U. Annby, S. Gronowitz, A. Hallberg: Reaction of the aromatic 1-(1-hexenyl)-2-thiomethylbenzene with  $\text{Cp}_2\text{Zr}(\text{H})\text{Cl}$ . Unexpected cleavage of the methyl-sulphur bond. *J Organomet Chem* 368 (1989) 295-302

69. U. Annby, J. Alvhäll, S. Gronowitz, A. Hallberg: Aspects of the hydrozirconation-isomerisation reaction.  
J Organomet Chem 377 (1989) 75-84
70. K. Sjödin, E. Nilsson, A. Hallberg, A. Tunek: Metabolism of N-acetyl-L-cysteine. Some structural requirements for the deacetylation and consequences for the oral bioavailability.  
Biochem Pharmacol 38 (1989) 3981-2985
71. C.-M. Andersson, A. Hallberg: Palladium-catalyzed vinylation of alkyl vinyl ethers with enol triflates. A convenient synthesis of 2-alkoxy-1,3-dienes.  
J Org Chem 54 (1989) 1502-1505
72. K. Karabelas, A. Hallberg: Stereoselective palladium-catalyzed synthesis of (Z)-trimethyl-(2-arylethenyl)silanes by arylation of (E)-1,2-bis(trimethylsilyl)ethylene. Effect of added halides compared to silver salts.  
J Org Chem 54 (1989) 1773-1776
73. L. Engman, A. Hallberg: Expedient synthesis of ebselen and related compounds.  
J Org Chem 54 (1989) 2964-2966
74. A. Hallberg, R. Isaksson, A. Martin, J. Sandström: Chromatographic resolution, circular dichroism spectra, and absolute configurations of dimers of 5H-indolo[1,7ab][1]-benzazepine and coumarin with C<sub>2</sub> symmetry.  
J Am Chem Soc 111 (1989) 4387-4392
75. S. Karlsson, A. Hallberg, S. Gronowitz: Hydrozirconation of oleylalcohol.  
J Am Oil Chem Soc 66 (1989) 1815-1821
76. G. D. Daves Jr., A. Hallberg: 1, 2-Additions to heteroatom-substituted olefins by organopalladium reagents.  
Chem Rev 89 (1989) 1433-1445
77. P. H. Dunbar, A. R. Martin, A. Hallberg: A novel pentacyclic phenothiazine.  
Chemica Scripta 29 (1989) 325-326
78. E. Karg, A. Tunek, H. Brötell, A. Hallberg, E. Rosengren, H. Rorsman: Glutathione in human melanoma cells. Effects of cysteine, cysteine esters and glutathione isopropyl ester.  
J Dermatol Sci 1 (1990) 39-46
79. K. Karabelas, A. Hallberg: Formation of 1-(trimethylsilyl)-1, 4-dienes by vinylation of allyltrimethylsilane in presence of the palladium(0)/silver salt system.  
Acta Chem Scand 44 (1990) 257-261
80. K. Nilsson, A. Hallberg: The effect of triethylamine on palladium-catalyzed arylation of vinyltrimethylsilane.  
Acta Chem Scand 44 (1990) 288-290
81. K. Nilsson, A. Hallberg: Regioselective palladium-catalyzed tandem  $\alpha$ -arylation/double bond isomerization of cyclic enamides.  
J Org Chem 55 (1990) 2464-2470
82. U. Annby, S. Gronowitz, A. Hallberg: Reactions with three hydrozirconiating reagents.  
Acta Chem Scand 44 (1990) 862-863
83. B. Andersson, H. Wikström, A. Hallberg: Synthesis of 3-dialkylaminochromans via thallium (III) induced cyclization of allyl aryl ethers.  
Acta Chem Scand 44 (1990) 1024-1028



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