

CURRICULUM VITAE

Ruedi Aebersold, Ph.D.

I. BIOGRAPHICAL DATA

Name:	Aebersold, Ruedi
Current Position:	Professor
Place of Birth:	Switzerland
Date of Birth:	September 12, 1954
Citizenship:	Swiss, Canadian

II. EDUCATION

- Undergraduate:
Biocenter, University of Basel, Switzerland.
1979 Diploma in Cellular Biology
- Graduate:
Ph.D. in Cellular Biology, Biocenter, University of Basel,
Switzerland, July 1983.
- Titles of theses written for graduate degrees:
Diploma Thesis: *Induction, expression and specificity of murine suppressor T-cells regulating antibody synthesis in vivo and in vitro*. Supervisor: R.H. Gisler, Ph.D.
- Ph.D. Thesis: *Structure-function relationships of hybridoma-derived monoclonal antibodies against streptococcal A group polysaccharide*. Supervisor: Prof. D.G. Braun.

III. Post-graduate training

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| 1984-1986 | Division of Biology, California Institute of Technology, Pasadena, CA.
Postdoctoral Position. |
| 1987-1988 | Division of Biology, California Institute of Technology, Pasadena, CA.
Senior Research Fellow |

IV. FACULTY POSITIONS

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| 1989 -1993 | Assistant Professor, Department of Biochemistry, University of British Columbia, Vancouver, B.C., Canada. |
| 1993 -1998 | Associate Professor, Department of Molecular Biotechnology, University of Washington, Seattle, WA |
| 1998 - 2000 | Professor, Department of Molecular Biotechnology, University of Washington, Seattle, WA |
| 2000 - 2006 | Affiliate Professor, Department of Molecular Biotechnology, University of Washington, Seattle, WA |
| 2000 | Co-Founder and Professor, Institute for Systems Biology, Seattle, WA |
| 2000 - 2009 | Professor, Institute for Systems Biology, Seattle, WA |
| 2001 - 2004 | Professor im Nebenamt, University of Zurich, Zurich, Switzerland |
| 2001 - 2006 | Affiliate Professor, Department of Genome Sciences, University of Washington, Seattle, WA |
| 2002 - 2004 | Affiliate Professor, Department of Microbiology, University of Washington, Seattle, WA |
| 2002 - 2008 | Affiliate Professor, Department of Chemistry, University of Washington, Seattle, WA |
| 2002 - present | Affiliate Professor, Department of Biochemistry, University of British Columbia, Vancouver |
| 2003 - present | Adjunct Faculty, Fred Hutchinson Cancer Research Center |
| 2004 - present | Professor of Systems Biology, Institute for Molecular Systems Biology, ETH Zurich and Faculty of Natural Sciences, University of Zurich. |

V. TEACHING (CLASSROOM)

1990-1991	UBC Biochemistry 300, Medicine 501
1991-1992	UBC Biochemistry 300, Biochemistry 402, 403
1992-1993	UBC Biochemistry 300, Biochemistry 402
1993-1994	UBC Biochemistry 300
1994-	UW Molecular Biotechnology II
1994-2001	UW Molecular Biotechnology 520, annually
1996-2001	UW Molecular Biotechnology 599, bi-annually
1999	UW Molecular Biotechnology 420
1998-2000	UW Bioengineering 510, selected topics
1997-2000	UW Medicinal Chemistry 540, selected topics
2002-present	ETH Zurich/University of Zurich, 2 week block course on proteomics
2003-present	ISB PI of quarterly 5-day course software tools for high throughput proteomics
2005-present	ETH Zurich Systems Biology Concept Course

VI. TEACHING (NATIONAL COURSES)

- Protein purification/characterization course at Cold Spring Harbor Laboratories, New York, 1989-1993.
- 2-D electrophoresis database course at Cold Spring Harbor Laboratories, New York, April 1993.
- ABRF 1998, Tutorial on 2D gel electrophoresis, San Diego, CA, Feb 1998
- HPCE 1999, Palm Springs, CA. Tutorial on proteome technology, Jan 1999
- HPCE 2000, Seattle, WA. Tutorial on proteome technology, Feb 2000

VII. HONORS AND AWARDS

- Swiss National Science Foundation Postdoctoral Fellowship (1984-85)
- EMBO Postdoctoral Fellowship (1985-1986)
- Swiss National Science Foundation Scholarship (1986-88)
- MRC Canada Scholarship (1990-95)
- Killam Research Prize (1993)
- Pehr Edman Award (1994)
- Boomer Lectures, University of Alberta, Edmonton (2000)
- American Society of Mass Spectrometry, Biemann Medal (2002)
- Michael Widmer Award (2002)
- World Technology Network Award, Biotechnology (2002)
- *Genome Technology* All-Stars, First place, Proteomics (2002)
- *Genome Technology* All-Star, First place, Proteomics (2003)

- HUPO Award for Achievement in Proteomics (2005)
- Barnett Lectures, Northeastern U, Boston
- FEBS Büchner Medal (2006)
- Seitz Lectures, University Chicago
- EMBO Member (2006)
- ABRF Award (2008)
- Pierce Affinity Award (2009)
- ISI Highly Cited Research (2009)
- ASBMB Herbert A. Sober Lectureship (2010)

VIII. ORGANIZATIONAL MEMBERSHIPS

- The Protein Society
- American Society for Biochemistry and Molecular Biology (ASBMB)
- American Association for the Advancement of Science (AAAS)
- Biotechnology Alliance of British Columbia
- New York Academy of Sciences
- American Chemical Society (ACS)
- American Association for Mass Spectrometry (ASMS)
- Honorary Fellow, Royal Society of Chemistry (RCS)
- Founding Member of the European Research Institute for Integrated Cellular Pathology (ERI-ICP)
- American Association for Cancer Research (AACR)

IX. EDITORIAL APPOINTMENTS

- Member, Editorial Board *Electrophoresis* 1989 -1993
- Member, Editorial Board *Analytical Biochemistry* 1991 - 2000
- Member, Editorial Board *Protein Science* 1992 - 1998
- Member, Editorial Board *Functional and Integrative Genomics* 1999 - present
- Member, Editorial Board *Proteomics* 1999 - present
- Senior Editor, *Physiological Genomics* 1999 - 2004
- Associate Editor, *Molecular Cellular Proteomics*, 2001 - present
- Member, Advisory Board *Genome Biology*, 2003 – present
- Member, Editorial Board *The Protein Journal*, 2004 – present
- Member, Editorial Board *Molecular Systems Biology*, 2004 – present
- Member, Editorial Advisory Board, *Current Analytical Chemistry*, 2005-present
- Member, Editorial Board, *Molecular Biosystems*, 2005-2007
- Member, Editorial Board, *Journal of Biochemical and Biophysical Methods*, 2005-2008

IX. NATIONAL COMMITTEES AND CONSULTANCIES

- Member, Resource Advisory Committee for QUEST Protein Database Center, Cold Spring Harbor Laboratory 1989 -1995
- Member, NIH (USA) Special Study Section 1990
- Member, NCI (Canada) Grant Review Panel H, 1990-1992
- Member, CODATA - Task Force for the Generation and Distribution of 2D Electrophoresis Protein Databases, 1992
- Member, Advisory Board for NIH Mass Spectrometry Resource Center at Rockefeller University, New York, 1991 - present
- Member, NCI panel to review intramural programs, 1997
- Member, MPSA organizing committee, 1998 – present
- HPCE Executive Committee, 1999 – present
- Pacific Rim Conference on Functional Genomics, Executive Committee, 1999 – present
- Program Chair, ASMS Asilomar Conference, 1999.
- Program Chair, ABRF conference, 2000
- Member, Science Advisory Committee, Genome Canada (SIAC), 2000-2003
- Member, Divisional Advisory Committee, Pacific Northwest National Laboratory, 2000-2006
- Member, Scientific Advisory Board, University of Zurich, Functional Genomics Center, 2001-present
- Member, Scientific Advisory Board, National University of Singapore, Functional Genomics Initiative, 2002-present
- Panel member, National Academy of Sciences, Proteomics Symposium, February 2002
- Panel member, National Cancer Institute, Gynecological Cancers Progress Review Group, August 2002
- Panel member, National Human Genome Research Institute, 2002-present
- Co-Chair, Proteomic Technologies for Early Cancer Detection, National Cancer Institute, April 2003
- Chair, Keystone Symposia, Proteomics: Technologies and Applications, March 2003
- Co-Chair, Proteomics In Diabetes, National Institutes of Health, April 2003
- Member, Scientific Advisory Board, Pacific Rim Biodefense Center at OHSU, 2003 – 2006
- Co-chair, HUPO PSI initiative, 2003 –2007
- Member, Scientific Advisory Board, National University of Singapore, Structural Biology and Proteomics Programme, 2003 – present
- Member, Advisory Committee, University of California, Los Angeles - Department of Energy, Institute for Genomics and Proteomics, 2003 –present
- Co-Chair, NIH workshop on standards in proteomics, Bethesda, Jan 05.
- Member of EMBO Publication Committee, Heidelberg, Oct 06.
- Keystone Symposia, SAB, 2005 - 2009
- Co-chair EU-NCI Conference on Systems Biology of Cancer, Bruxelles, Belgium 2008
- Vice-chair, ESF Symposium on Systems Biology, Barcelona Spain, 2008

- Co-chair, HUPO World Congress, Amsterdam the Netherlands, 2008
- Member National Science and Technology Development Agency (NSTDA), Bangkok, Thailand, 2007-present

X. PRIVATE SECTOR RELATIONSHIPS

- Member, Scientific Advisory Board, Osiris Therapeutics, Baltimore, MD, 1994-1996
- Member, Scientific Advisory Board, Oxford GlycoSciences, Oxford, UK. 1996-2002
- Member, Scientific Advisory Board, Rosetta, BioInpharmatics, Kirkland, WA. 1997-2001
- Member, Scientific Advisory Board, ActivX, La Jolla, CA, 2000-2005
- Founder, MacroGenics (with Drs. Alan Aderem and Lee Hood, Institute for Systems Biology, Seattle, WA.), and Dr. Jeffrey Ravetch, (Rockefeller University, New York, NY) 2000.
- Member, Scientific Advisory Board, Seattle Biomedical Research Institute Proteomics Advisory Committee, 2003 – 2006
- Member, Scientific Advisory Board, Insilicos, Seattle, WA

BIBLIOGRAPHY

Peer Reviewed Publications:

1. Aebersold R, Chang JY, Knecht R, and Braun DG. (1981) Comparative amino acid sequences of murine, monoclonal antibodies against streptococcal group A polysaccharide. *Immunobiology* 160:1.
2. Herbst H, Chang JY, Aebersold R, and Braun DG. (1982) Murine vk25 isotype sequence: Monoclonal antibody 2S1.3 specific for the group A streptococcal polysaccharide, Hoppe Seyler's Z. *Physiol Chem* 363:1069-1076.
3. Chang JY, Herbst H, Aebersold R, and Braun DG. (1983) A new isotype sequence (Vk27) of the variable region of kappa-light chains from a mouse hybridoma-derived anti (streptococcal group A polysaccharide) antibody containing an additional cysteine residue. Application of the dimethylamino-azobenzene isothiocyanate technique for the isolation of peptides. *Biochem J* 211:173-180.
4. Aebersold R, Ledermann F, Braun DG, and Chang JY. (1984) Microisolation of DABITC derivatized proteins by gel electrophoresis: Application to the purification of antibody heavy and light chains. *Anal Biochem* 136:465-469.
5. Aebersold R, Herbst H, Grutter T, Chang JY, and Braun DG. (1984) Murine vk25 and vk27 amino acid sequences of C57/B16 origin: Antibodies 17S29.1 and 22S25.1 specific for the group A streptococcal polysaccharide, Hoppe Seyler's Z. *Physiol Chem* 365:1375-1383.
6. Aebersold R, Herbst H, Chang JY, and Braun DG. (1984) Murine vk21A isotype sequence: Monoclonal antibody 50S10.1 specific for the group A streptococcal polysaccharide. Hoppe Seyler's Z. *Physiol Chem* 365:1385-1391.
7. Heusser CH, Bews JPA, Aebersold R, and Blaser K. (1984) Anti PC antibodies with preferred reactivity for either PC or PC-phenyl represent independent expressions. *Ann d'Immunol* 35:123-129.

8. Todd I, Chang SP, Perlmutter RM, Aebersold R, Heusser CH, Hood LE, and Rittenberg MB. (1984) Immunologic memory to phosphocholine V. Hybridomas representative of group 11 antibodies utilize vki-3 gene(s). *J Immunol* 132:1556-1560.
9. Oesch B, Westaway D, Wälchli M, McKinley MP, Kent SBH, Aebersold R, Barry RA, Tempst P, Teplow DB, Hood LE, Prusiner SB, and Weissmann C. (1985) A cellular gene encodes scrapie PrP 27-30 protein. *Cell* 40:735-746.
10. Jong AYS, Aebersold R, and Campbell JL. (1985) Multiple species of single-stranded nucleic acid-binding proteins in *Saccharomyces cerevisiae*. *J Biol Chem* 260:16367-16374.
11. Aebersold R, Teplow DB, Hood LE, and Kent SBH. (1986) High efficiency preparation of proteins from analytical sodium dodecyl sulfate-polyacrylamide gels for direct sequence analysis. *J Biol Chem* 261:4229-4238.
12. Kieffer B, Goeldner M, Hirth C, Aebersold R, and Chang JY. (1986) Sequence determination of peptide fragment from electric eel acetylcholine esterase, involved in the binding of quaternary ammonium. *FEBS Lett* 202:91-96
13. Aebersold R, Teplow DB, Hood LE, and Kent SBH. (1986) Electrophoretic transfer from immobilized isoelectric focusing gels for direct protein sequence determination. In: *Protides of the Biological Fluids*, H. Peeters (ed.), Elsevier, Amsterdam, 34:715-718.
14. Rice CM, Aebersold R, Teplow DB, Pata J, Bell JR, Vorndam AV, Trent DW, Brandriss MW, Schlesinger JJ, and Strauss JH. (1986) Partial N-terminal amino acid sequences of three nonstructural proteins of two flaviviruses. *Virology* 151:1-9.
15. Tempst P, Woo DDL, Teplow DB, Aebersold R, Hood L, and Kent SBH. (1986) Microscale structure analysis of a high-molecular-weight, hydrophobic membrane glycoprotein fraction with platelet-derived growth factor-dependent kinase activity. *J Chromatography* 369:403-412.
16. Clark-Lewis I, Aebersold R, Ziltener HJ, Schrader JW, Hood LE, and Kent SBH. (1986) Automated chemical synthesis of a protein growth factor for hemopoietic cells, interleukin-3. *Science* 231:134-139.
17. Rittenberg MB, Glanville RW, Aebersold R, Chang SP, and Brown M. (1986) Immunologic memory to phosphorylcholine (PC) VII. Expression of the V_H-12 gene product in the response to PC-keyhole limpet hemocyanin. *Eur J Immunol* 16:503-507.
18. Herbst H, Grutter T, Aebersold R, and Braun DG. (1986) The complete amino acid sequence of the variable domain of a monoclonal anti-streptococcal Group A polysaccharide antibody. *Biol Chem (Hoppe-Seyler)* 367:843-851.
19. Aebersold R, Leavitt J, Saavedra R, Hood LE, and Kent SBH. (1987) Internal amino acid sequence analysis by *in situ* protease digestion on nitrocellulose of proteins separated by one- or two-dimensional gel electrophoresis. *Proc Natl Acad Sci USA* 84:6970-6974.
20. Leptin M, Aebersold R, and Wilcox M. (1987) *Drosophila* position-specific antigens resemble vertebrate fibronectin-receptors. *EMBO J* 6:1037-1043.

21. Kent S, Hood L, Aebersold R, Teplow D, Smith L, Farnsworth V, Cartier P, Hines W, Hughes P, and Dodd C. (1987) Approaches to subpicomole protein sequencing. *Biotechniques* 5:314-321.
22. Aebersold R, Pipes G, Nika H, Hood LE, and Kent SBH. (1988) Covalent Immobilization of Proteins for High Sensitivity Sequence Analysis: Electroblotting onto DITC Glass from SDS-PAGE. *Biochemistry* 27:6860-6867.
23. Aebersold R, Pipes G, Hood LE, and Kent SBH. (1988) N-terminal and internal sequence determination of microgram amounts of proteins separated in Immobililine isoelectric focusing gels. *Electrophoresis* 9:520-530.
24. Lin CS, Aebersold R, Kent SBH, Varma M, and Leavitt J. (1988) Molecular characterization of plastin: A human leukocyte protein expressed in transformed human fibroblasts. *Mol Cell Biology* 8:4659-4688.
25. Bruderer U, Aebersold R, Blaser K, and Heusser CH. (1988) Characterization of the group I and group II antibody response against PC-KLH in normal and T15 idiotype suppressed Balb/c mice. *Immunology* 64:385-390.
26. Gautam N, Baetscher M, Aebersold R, and Simon MC. (1989) A G-protein gamma subunit shares homology with ras proteins. *Science* 244:971-974.
27. Yamamori T, Fukada K, Aebersold R, Korsching S, Fann MJ, and Patterson P. (1989) The cholinergic neuronal differentiation factor is identical to the Leukemia inhibitory factor. *Science* 246:1412-1416.
28. Laug WE, Aebersold R, Jong A, Bergman BL, and Baker J. (1989) Isolation of multiple types of plasminogen activator inhibitors from vascular smooth muscle cells. *Thrombosis and Haemostasis* 61:517-521.
29. Saavedra R, Fors L, Aebersold R, Arden B, Horvath S, Sanders J, and Hood L. (1989) The myelin proteins of the shark brain are similar to the myelin proteins of the mammalian peripheral nervous system *J Mol Evol* 29:149-156.
30. Aebersold R, Pipes G, Wettenhall REH, Nika H, and Hood LE. (1990) Covalent attachment of peptides for high sensitivity solid-phase sequence analysis. *Anal Biochem* 187:56-65.
31. Aebersold R and Leavitt J. (1990) Sequence Analysis of Proteins Separated by Polyacrylamide Gel Electrophoresis: Towards an Integrated Protein Database. *Electrophoresis* 11:517-527.
32. Lin CS, Aebersold R, and Leavitt J. (1990) Correction of the N-terminal sequences of the human plastin isoforms using "anchored PCR": Identification of a potential calcium binding domain. *Mol Cell Biol* 10:1818-1821.
33. Aebersold R and Morrison HD. (1990) Separation of dilute peptide samples by capillary zone electrophoresis. *J Chromat* 516:79-88.
34. Kalmar GB, Kay RJ, Lachance A, Aebersold R, and Cornell RP. (1990) Cloning and expression of rat liver cytidyltransferase: An amphipathic protein that controls phosphatidylcholine synthesis. *Proc Natl Acad Sci USA* 87: 6029-6033.

35. Withers SG, Warren AJ, Street IP, Rupitz K, Kempton JB, and Aebersold R. (1990) Unequivocal demonstration of the involvement of a glutamate residue as a nucleophile in the mechanism of a glycosidase. *J Am Chem Soc* 112:5887-5889.
36. Sanghera J, Aebersold R, Morrison HD, Bures EJ, and Pelech S. (1990) Identification of the sites in myelin basic protein that are phosphorylated by meiosis-activated protein kinase p44^{mpk}. *FEBS* 273:223-226.
37. Wettenhall EH, Aebersold R, and Hood LE. (1991) Solid-phase sequencing of ³²P labeled phosphopeptides at picomole and subpicomole levels. *Meth Enz* 201:186-199.
38. Coull JM, Pappin DJC, Mark J, Aebersold R, and Koester M. (1991) Use of functionalized membrane supports for covalent microsequence analysis. *Anal Biochem* 194:110-120.
39. Clark-Lewis I, Moser B, Walz A, Baggiolini M, Scott GJ, and Aebersold R. (1991) Chemical synthesis, purification and characterization of two inflammatory proteins, neutrophil activating peptide-1 (Interleukin 8) and neutrophil activating peptide-2. *Biochemistry* 30:3128-3135.
40. Pichersky E, Subramaniam R, White MJ, Reid J, Aebersold R, and Green BR. (1991) Chlorophyll a/b binding (CAB) polypeptides of CP29, the internal chlorophyll a/b complex of PSII: characterization of the tomato gene encoding 26 kDa (type 1) polypeptide, and evidence for a second CP29 polypeptide. *Mol Gen Genet* 227:277-284.
41. Keller SE, Kitagawa K, Aebersold R, Lienhard GE, and Garner CE. (1991) Isolation and characterization of the 160,000-Da Phosphotyrosyl protein, a putative participant in insulin signaling. *J Biol Chem* 266:12817-12820.
42. Babcock J, Watts J, Aebersold R, and Ziltener HJ. (1991) Automated, non-isotopic assay for protein tyrosine kinase and protein tyrosine phosphatase activities. *Anal Biochem* 196:245-251.
43. Patel SD, Aebersold R, and Attardi G. (1991). cDNA-derived amino acid sequence of the NADH-binding 51kDa subunit of the bovine respiratory NADH dehydrogenase reveals striking similarities to a bacterial NAD⁺ reducing hydrogenase. *Proc Natl Acad Sci, USA* 88:4225-4229.
44. Gilkes NR, Claeysens M, Aebersold R, Henrissat B, Meinke A, Horinouchi S, Morrison HD, Kilburn DG, Warren AJ, and Miller RC. (1991) Structural and functional comparisons of b1,4 glycanases from families B and F, including assignment of disulfide bonds in CenA and Cex from *Cellulomonas Fimi*. *Eur J Biochem* 202:367-377.
45. Posada J, Sanghera J, Aebersold R, Pelech S, and Cooper JA. (1991) Tyrosine phosphorylation and activation of homologous protein kinases during oocyte maturation and mitogenic activation of fibroblasts. *Mol Cell Biol* 11:2517-2528.
46. Tull D, Withers SG, Warren RAJ, and Aebersold R. (1991) Glutamic acid 274 is the nucleophile in the active site of a “retaining” exoglucanase from *Cellulomonas fimi*. *J Biol Chem* 266:15621-15625.
47. Aebersold R, Watts J, Morrison HD, and Bures EJ. (1991) Determination of the site of tyrosine phosphorylation at the low picomole level by solid-phase sequence analysis. *Anal Biochem* 199, 51-60.

48. te Heesen S, Rauhut R, Aebersold R, Abelson J, Aebi M, and Clark MW. (1991) A 45kDa yeast transmembrane protein reacts with anti nuclear pore antibodies: purification of the protein, immunolocalization and cloning of the gene. *Eur J Cell Biology* 56:8-18.
49. Schwartz E, Stasys R, Aebersold R, McGrath JM, Green B, and Pichersky E. (1991) Sequence of a tomato gene encoding a third type of LHC II chlorophyll A/B - binding protein. *Plant Mol. Biology* 17:923-925.
50. Barber DL, Sanders EJ, Aebersold R, and Schneider WJ. (1991) The receptor for yolk lipoprotein recognition in the chicken oocyte. *J Biol Chem* 266:18761-18770.
51. Stifani S, Barber DL, Aebersold R, Steyrer E, Shen X, Nimpf J, and Schneider WJ. (1991) The laying hen expresses two different low density lipoprotein receptor-related proteins. *J Biol Chem* 266:19079-19087.
52. Schwartz E, Shen D, Aebersold R, McGrath JM, Pichersky E, and Green BR. (1991) Nucleotide sequence and chromosomal location of Cab 11 and Cab 12, the genes for the fourth polypeptide of the Photosystem I light harvesting antenna (LHCI). *FEBS Lett* 280:229-234.
53. Suyama K, Goldstein J, Aebersold R, and Kent SBH. (1991) Regarding the size of Rh proteins [letter]. *Blood* 77:411.
54. Shi L, Kraut R, Aebersold R, and Greenberg A. (1992) A natural killer (NK) cell granule protein that induces DNA fragmentation and apoptosis. *J Exp Med* 175:553-566.
55. Ettehadieh E, Sanghera JS, Pelech S, Hess D, Watts J, Shastri N, and Aebersold R. (1992) Tyrosyl phosphorylation and activation of MAP kinases by p56^{lck}. *Science* 255:853-855.
56. Liu MS, Aebersold R, and Lee CYG. (1992) Molecular and Developmental studies of a sperm occurrence antigen recognized by HS-63 monoclonal antibody. *Biol Reprod* 46:937-948.
57. Watts JD, Wilson G, Ettehadieh E, Kubanek CA, Astell CR, Marth JD, and Aebersold R. (1992) Purification and initial characterization of the lymphocyte-specific protein tyrosine kinase p56^{lck} from a baculovirus expression system. *J Biol Chem* 267: 901-907.
58. Patterson SD, Hess D, Yungwirth T, and Aebersold R. (1992) High yield recovery of electroblotted proteins and cleavage fragments from a cationic polyvinylidene fluoride based membrane. *Anal Biochem* 202:193-203.
59. Aebersold R, Bures EJ, Namchuck M, Goghari MN, Shushan B, and Covey TC. (1992) Design, synthesis and characterization of a protein sequencing reagent yielding amino acid derivatives with enhanced detectability by mass spectrometry. *Prot Sci* 1:494-503.
60. Ramachandran C, Aebersold R, Tonks NK, and Pot DA. (1992) Sequential dephosphorylation of a multiply phosphorylated insulin receptor peptide by protein tyrosine phosphatases. *Biochemistry* 31:4232-4238.
61. Paison SG, Hines JC, Aebersold R, and Ray DS. (1992) Molecular cloning and expression of the gene encoding the kinetoplast-associated type II DNA topoisomerase of crithidia fasciculata, *Mol Biochem Parasitol* 50:57-68.

62. Gebler JC, Aebersold R, and Withers SG. (1992) Glu 537, not Glu 461 is the nucleophile in the active site of (lac Z) β -galactosidase from *Escherichia coli*. *J Biol Chem* 267:11126-11130.
63. Schindler C, Fu XY, Improtta T, Aebersold R, and Darnell JE. (1992) Proteins of the transcription factor ISGF-3: One gene encodes 91 and 84-kDa ISGF-3 proteins that are activated by interferon alpha. *Proc Natl Acad Sci USA* 89:7836-7839.
64. Fu XY, Schindler C, Improtta T, Aebersold R, and Darnell JE. (1992) The proteins of ISGF3, the IFN- α induced activator, define a new gene family of signal transducers. *Proc Natl Acad Sci USA*, 89:7480-7843.
65. Green B, Shen D, Aebersold R, and Pichersky E. (1992) Identification of the polypeptides of the major light-harvesting complex of photosystem II (LHCII) with their genes in tomato. *FEBS* 305:18-22
66. Veals SA, Fu XY, Leonard D, Schindler A, Aebersold R, Darnell JE, and Levy DE. (1992) Subunit of an IFN α responsive transcription factor is related to interferon regulatory factor and Myb Families of DNA binding proteins. *Mol Cell Biol* 12:315-3324.
67. Carter JR, Franden MA, McHenry CS, and Aebersold R. (1992) Molecular cloning, sequencing, and overexpression of the structural gene encoding the delta subunit of *E. coli* DNA polymerase III holoenzyme. *J Bacteriol* 174:7013-7025.
68. Shi L, Kam CM, Powers J, Aebersold R, and Greenberg A. (1992) Purification of three cytotoxic lymphocyte granule serine proteases that induce apoptosis through distinct substrate and target cell interactions. *J Exp Med* 176:1521-1529.
69. Kim S, Sandusky P, Bowlby NR, Aebersold R, Green B, Vlahakis S, Yocum F, and Pichersky E. (1992) Characterization of a spinach psbS cDNA encoding the 22kDa protein of photosystem II. *FEBS Lett* 314:67-71.
70. Vogt T, Aebersold R, and Ellis B. (1993) Purification and characterization of Sinapine synthase from seeds *Brassica napus*. *Arch Biochem Biophys* 300:622-628.
71. Kabir S, Aebersold R, and Daar AS. (1993) Identification of a novel 4 kDa immunoglobulin A binding peptide obtained after limited proteolysis of jacalin. *Biochem Biophys Acta* 1161:194-200.
72. Daga A, Micol V, Hess D, Aebersold R, and Attardi G. (1993) Molecular characterization of the transcription termination factor (mTERF) from human mitochondria. *J Biol Chem* 268:8123-8130.
73. Keller S, Aebersold R, Garner C, and Lienhard GE. (1993) The insulin-elicited 160kDa phosphotyrosine protein in mouse adipocytes is an insulin receptor substrate 1: Identification and cloning. *Biochem Biophys Acta* 1172:323-326.
74. Harrington MG, Aebersold R, Martin BO, Merrill CR, and Hood LE. (1993) Identification of a brain-specific cerebrospinal fluid glycoprotein beta-trace protein. *Appl Theor Electrophor* 3:229-234.
75. Wang Q, Tull D, Meinke A, Gilkes NR, Warren RAJ, Aebersold R, and Withers, S.G. (1993) Glu 280 is the nucleophile in the active site of *clostridium thermocellum* Cel C, a family A endo-beta-1,4 glucanase. *J Biol Chem* 268:14096-14102.

76. Watts JD, Sanghera JS, Pelech S, and Aebersold R. (1993) Phosphorylation of Serine 59 of p56^{lck} in activated T cells. *J Biol Chem* 268:23275-23482.
77. Van Oers NSC, Tao W, Watts JD, Johnson P, Aebersold R, and Teh HS. (1993) Constitutive tyrosine phosphorylation of the T-cell receptor (TCR) zeta subunit: Regulation of TCR associated tyrosine kinase activity by TCR zeta. *Mol Cell Biol* 13: 5771-5780.
78. Hess D, Covey TC, Winz R, Brownsey R, and Aebersold R. (1993) Analytical and micropreparative peptide mapping by high-performance liquid chromatography/ion spray mass spectrometry of proteins purified by gel electrophoresis. *Prot Sci* 2:1342-1351.
79. Bures EJ and Aebersold R. (1993) A device for the quantitative collection of derivatives generated by chemical protein sequence analysis. *Meth Mol Biol* 4:115-120.
80. Watts JD, Welham MJ, Kalt L, Schrader JW, and Aebersold R. (1993) IL-2 stimulation of T-lymphocytes induces sequential activation of mitogen-activated protein kinases and phosphorylation of p56^{lck} on serine 59. *J Immunol* 151:6862-6871.
81. Carter JR, Franden MA, Aebersold R, and McHenry CS. (1993) Identification, isolation and characterization of the structural gene encoding the delta subunit of E. coli DNA polymerase III holoenzyme. *J Bact* 175:3812-3822.
82. Carter JR, Franden MA, Aebersold R, Kim DR, and McHenry CS. (1993) Identification, isolation, and overexpression of the gene encoding the psi subunit of E. coli DNA polymerase III holoenzyme. *J Bact* 175:5604-5610.
83. Carter JR, Franden MA, Aebersold R, and McHenry CS. (1993) Identification, sequencing, and overexpression of the gene encoding the theta subunit of DNA polymerase III holoenzyme. *Nucl Acids Res* 21:3281-3286.
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