Stanford

Jane Parnes

Professor of Medicine, Emerita

CONTACT INFORMATION

- **Alternate Contact**

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Bio

ACADEMIC APPOINTMENTS

- Emeritus Faculty, Acad Council, Medicine

HONORS AND AWARDS

- National Merit Scholar, National Merit Scholarship Corporation (1968)
- A.B. summa cum laude, Radcliffe College (1972)
- Postdoctoral Fellowship, The Jane Coffin Childs Memorial Fund for Medical Research (08/78-01/80)
- National Research Service Award (Postdoctoral Fellowship), NIAID, NIH (02/80-01/82)
- Hume Faculty Scholar, Stanford University (09/82-08/83)
- Mellon Foundation Fellowship, Stanford University (09/83-08/84)
- Postdoctoral Fellowship, John A. and George L. Hartford Fellowship (07/84-06/87)
- Faculty Research Award (funding declined because of AHA Award), American Cancer Society (07/87)
- Scholar Award (funding declined because of AHA Award), Leukemia Society of America (07/87)
- Established Investigator Award, American Heart Association (07/87-06/92)
- Speaker, Leukemia Society of America Speaker, UCLA (06/89)
- 1991 Young Investigator Award, Western Society for Clinical Investigation (02/91)
- Wellcome Visiting Professor, Medical College of Virginia (11/92)

PROFESSIONAL EDUCATION

- M.D., Harvard Medical School , Medicine (1976)
- A.B., Radcliffe College, Cambridge, MA , Biochemical Sciences (1972)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

CD72 is a B lymphocyte surface protein expressed from early stages of B cell development through to the mature B cell stage, but its expression is turned off as B cells differentiate into plasma cells. To elucidate the function of CD72 we have used gene targeting to generate homozygous mutant mice that totally lack CD72 expression. The B cells in these mice are hyper-responsive to stimulation through the B cell receptor. These data indicate that CD72 plays a negative regulatory role on B cell responsiveness. In accord with our findings, an ITIM motif in the cytoplasmic tail of CD72 has been shown to bind to the tyrosine phosphatase SHP-1, a feature characteristic of other surface proteins that negatively regulate lymphocyte responses. We postulate that CD72 is involved in setting the threshold for B cell responsiveness and that it therefore plays an important role in B cell repertoire selection. Our current studies are examining how CD72 regulates the balance between B cell tolerance and autoimmunity in several model systems. We have evidence that the CD72-deficient mice are more susceptible to the induced autoimmune disease experimental allergic encephalomyelitis, a mouse model of multiple sclerosis. We are studying the mechanisms responsible for the increased severity of disease in CD72-deficient mice. CD72-deficient mice also develop spontaneous autoimmune disease as they age, characterized by production of antinuclear antibodies including anti-single-stranded- and anti-double-stranded-DNA antibodies and eventual development of glomerulonephritis. Current studies are aimed at further characterizing the autoantibodies produced, determining the regulatory changes responsible for their production, as well as their pathogenicity. We are additionally studying the mechanisms by which CD72-deficiency leads to a partial abrogation of B cell anergic tolerance in mice in which all B cells express a transgenic B cell receptor specific for hen-egg lysozyme (HEL) and in which the antigen HEL is expressed in the serum. Finally, the lab is examining the biochemistry of signaling through CD72 to determine the molecular mechanisms by which CD72 regulates B cell responsiveness.

Teaching

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Immunology (Phd Program)
- Medicine (Masters Program)

Publications

PUBLICATIONS

- **Medicine on a need-to-know basis** *NATURE IMMUNOLOGY*
  Busch, R., Byrne, B., Gandrud, L., Sears, D., Meyer, E., Kattah, M., Kurihara, C., Haertel, E., Parnes, J. R., Mellins, E. D.
  2006; 7 (6): 543-547
- **CD72 down-modulates BCR-induced signal transduction and diminishes survival in primary mature B lymphocytes** *JOURNAL OF IMMUNOLOGY*
  Li, D. H., Tung, J. W., Tarner, I. H., Snow, A. L., Yukinari, T., Ngernmaneepothong, R., Martinez, O. M., Parnes, J. R.
  2006; 176 (9): 5321-5328
- **Mouse splenic B lymphocyte activation using different activation stimuli induces in vitro splicing of tumor necrosis factor-alpha nuclear pre-mRNA** *MOLECULAR IMMUNOLOGY*
  Li, Y. Y., Yang, Y., Bao, M., Edwards, C. K., Parnes, J. R.
  2006; 43 (6): 613-622
- **Dual regulation of BCR-mediated growth inhibition signaling by CD72** *EUROPEAN JOURNAL OF IMMUNOLOGY*
  Baba, T., Fusaki, N., Aoyama, A., Li, D. H., Okamura, R. M., Parnes, J. R., Hozumi, N.
  2005; 35 (5): 1634-1642
- **Woodchuck interleukin-6 gene: structure,characterization, and biologic activity** *GENE*
  Li, D. H., Kumanogoh, A., Cao, T. M., Parnes, J. R., Cullen, J. M.
  2004; 342 (1): 157-164
- **OX52 is the rat homologue of CD6: evidence for an effector function in the regulation of CD5 phosphorylation** *JOURNAL OF LEUKOCYTE BIOLOGY*
  Castro, M. A., Nunes, R. J., Oliveira, M. I., Tavares, P. A., Simoes, C., Parnes, J. R., MOREIRA, A., Carmo, A. M.

2003; 73 (1): 183-190

- **CD6: expression during development, apoptosis and selection of human and mouse thymocytes** *INTERNATIONAL IMMUNOLOGY*
  Singer, N. G., Fox, D. A., Haqqi, T. M., Beretta, L., Endres, J. S., Prohaska, S., Parnes, J. R., Bromberg, J., Sramkoski, R. M.
  2002; 14 (6): 585-597

- **Identification of CD72 as a lymphocyte receptor for the class IV semaphorin CD100: A novel mechanism for regulating B cell signaling** *IMMUNITY*
  Kumanogoh, A., Watanabe, C., Lee, I., Wang, X. S., Shi, W., Araki, H., Hirata, H., Iwahori, K., Uchida, J., Yasui, T., Matsumoto, M., Yoshida, K., Yakura, et al
  2000; 13 (5): 621-631

- **The class IV semaphorin CD100 plays nonredundant roles in the immune system: Defective B and T cell activation in CD100-deficient mice** *IMMUNITY*
  Shi, W., Kumanogoh, A., Watanabe, C., Uchida, J., Wang, X. S., Yasui, T., Yukawa, K., Ikawa, M., Okabe, M., Parnes, J. R., Yoshida, K., Kikutani, H.
  2000; 13 (5): 633-642

- **CD72, a negative regulator of B-cell responsiveness** *IMMUNOLOGICAL REVIEWS*
  Parnes, J. R., Pan, C.
  2000; 176: 75-85

- **CD72-deficient mice reveal nonredundant roles of CD72 in B cell development and activation** *IMMUNITY*
  Pan, C., Baumgarth, N., Parnes, J. R.
  1999; 11 (4): 495-506

- **Regulation of mouse CD72 gene expression during B lymphocyte development** *JOURNAL OF IMMUNOLOGY*
  Ying, H., Healy, J. I., Goodnow, C. C., Parnes, J. R.
  1998; 161 (9): 4760-4767

- **Distinct stage-specific cis-active transcriptional mechanisms control expression of T cell coreceptor CD8 alpha at double- and single-positive stages of thymic development** *JOURNAL OF IMMUNOLOGY*
  Zhang, X. L., Seong, R., Piracha, R., Larijani, M., Heeney, M., Parnes, J. R., Chamberlain, J. W.
  1998; 161 (5): 2254-2266

- **T cell receptor (TCR) engagement leads to activation-induced splicing of tumor necrosis factor (TNF) nuclear pre-mRNA** *JOURNAL OF EXPERIMENTAL MEDICINE*
  Yang, Y., Chang, J. F., Parnes, J. R., Fathman, C. G.
  1998; 188 (2): 247-254

- **Mechanisms of CD8 beta-mediated T cell response enhancement: Interaction with MHC class I beta(2)-microglobulin and functional coupling to TCR/CD3** *JOURNAL OF IMMUNOLOGY*
  Wheeler, C. J., Chen, J. Y., Potter, T. A., Parnes, J. R.
  1998; 160 (9): 4199-4207

- **PU.1/Spi-1 is essential for the B cell-specific activity of the mouse CD72 promoter** *JOURNAL OF IMMUNOLOGY*
  Ying, H., Chang, J. F., Parnes, J. R.
  1998; 160 (5): 2287-2296

- **The level of CD4 surface protein influences T cell selection in the thymus** *JOURNAL OF IMMUNOLOGY*
  Frank, G. D., Parnes, J. R.
  1998; 160 (2): 634-642

- **Specific demethylation of the CD4 gene during CD4 T lymphocyte differentiation** *MOLECULAR IMMUNOLOGY*
  LANDOLFI, M. M., Scollay, R., Parnes, J. R.
  1997; 34 (1): 53-61

- **Allele-specific expression of the mouse B-cell surface protein CD72 on T cells** *IMMUNOGENETICS*
  Robinson, W. H., LANDOLFI, M. M., Parnes, J. R.
  1997; 45 (3): 195-200

- **Molecular linkage of the mouse CD5 and CD6 genes** *IMMUNOGENETICS*
  LECOMTE, O., Bock, J. B., Birren, B. W., Vollrath, D., Parnes, J. R.
  1996; 44 (5): 385-390

- **IDENTIFICATION OF A MOUSE PROTEIN HOMOLOGOUS TO THE HUMAN CD6 T-CELL SURFACE PROTEIN AND SEQUENCE OF THE CORRESPONDING CDNA** *JOURNAL OF IMMUNOLOGY*
  Robinson, W. H., Prohaska, S. S., Santoro, J. C., Robinson, H. L., Parnes, J. R.
  1995; 155 (10): 4739-4748
- **HUMAN CD6 POSSESSES A LARGE, ALTERNATIVELY SPLICED CYTOPLASMIC DOMAIN** *EUROPEAN JOURNAL OF IMMUNOLOGY*
  Robinson, W. H., DEVEGVAR, H. E., Prohaska, S. S., Rhee, J. W., Parnes, J. R.
  1995; 25 (10): 2765-2769
- **STRUCTURE OF THE MOUSE CD72 (LYB-2) GENE AND ITS ALTERNATIVELY SPLICED TRANSCRIPTS** *JOURNAL OF IMMUNOLOGY*
  Ying, H., Nakayama, E., Robinson, W. H., Parnes, J. R.
  1995; 154 (6): 2743-2752
- **CD4 and CD8 in T cell lineage commitment: alterations induced by expression of a CD8/CD4 chimeric transgene.** *Seminars in immunology*
  Parnes, J. R., Seong, R. H.
  1994; 6 (4): 221-229
- **BIOCHEMICAL IDENTITY OF THE MOUSE LY-19.2 AND LY-32.2 ALLOANTIGENS WITH THE B-CELL DIFFERENTIATION ANTIGEN LYB-2/CD72** *JOURNAL OF IMMUNOLOGY*
  Robinson, W. H., LANDOLFI, M. M., Schafer, H., Parnes, J. R.
  1993; 151 (9): 4764-4772
- **CD2(-)CD4(-)CD8(-) LYMPH-NODE T-LYMPHOCYTES IN MRL LPR LPR MICE ARE DERIVED FROM A CD2(+)CD4(+)CD8(+) THYMIC PRECURSOR** *JOURNAL OF IMMUNOLOGY*
  LANDOLFI, M. M., VanHouten, N., Russell, J. Q., Scollay, R., Parnes, J. R., Budd, R. C.
  1993; 151 (2): 1086-1096
- **ROLE OF CD4 AND CD8 IN T-CELL ACTIVATION AND DIFFERENTIATION** *ADVANCES IN IMMUNOLOGY, VOL 53*
  Miceli, M. C., Parnes, J. R.
  1993; 53: 59-122
- **POLYMORPHIC SPECIFICITY OF Q1/28, A MONOCLONAL-ANTIBODY THAT PREFERENTIALLY REACTS WITH FREE CLASS-I HEAVY-CHAINS** *IMMUNOGENETICS*
  Benjamin, R. J., Abrams, J. R., Parnes, J. R., Madrigal, J. A., Parham, P.
  1992; 37 (1): 73-76
- **EXTENSIVE POLYMORPHISM IN THE EXTRACELLULAR DOMAIN OF THE MOUSE B-CELL DIFFERENTIATION ANTIGEN LYB-2/CD72** *JOURNAL OF IMMUNOLOGY*
  Robinson, W. H., Ying, H., Miceli, M. C., Parnes, J. R.
  1992; 149 (3): 880-886
- **AN IMMUNOLOGICAL ROLE FOR THE CD8 BETA-CHAIN** *NATURE*
  Wheeler, C. J., VONHOEGEN, P., Parnes, J. R.
  1992; 357 (6375): 247-249
- **SIGNAL FOR T-CELL DIFFERENTIATION TO A CD4 CELL LINEAGE IS DELIVERED BY CD4 TRANSMEMBRANE REGION AND OR CYTOPLASMIC TAIL** *NATURE*
  Seong, R. H., Chamberlain, J. W., Parnes, J. R.
  1992; 356 (6371): 718-720
- **ALTERATION OF T-CELL LINEAGE COMMITMENT BY EXPRESSION OF A HYBRID CD8/CD4 TRANSGENE** *4TH INTERNATIONAL CONF ON LYMPHOCYTE ACTIVATION AND IMMUNE REGULATION*
  Seong, R. H., Parnes, J. R.
  PLENUM PRESS DIV PLENUM PUBLISHING CORP.1992: 79–87
- **IDENTITY OF HUMAN LYB-2 AND CD72 AND LOCALIZATION OF THE GENE TO CHROMOSOME-9** *EUROPEAN JOURNAL OF IMMUNOLOGY*
  VONHOEGEN, I., Hsieh, C. L., SCHARTING, R., FRANCKE, U., Parnes, J. R.
  1991; 21 (6): 1425-1431
- **The roles of CD4 and CD8 in T cell activation.** *Seminars in immunology*
  Miceli, M. C., Parnes, J. R.

1991; 3 (3): 133-141

- **ADHESION VERSUS CORECEPTOR FUNCTION OF CD4 AND CD8 - ROLE OF THE CYTOPLASMIC TAIL IN CORECEPTOR ACTIVITY** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Miceli, M. C., VONHOEGEN, P., Parnes, J. R.
  1991; 88 (7): 2623-2627
- **IDENTIFICATION OF A HUMAN PROTEIN HOMOLOGOUS TO THE MOUSE LYB-2 B-CELL DIFFERENTIATION ANTIGEN AND SEQUENCE OF THE CORRESPONDING CDNA** *JOURNAL OF IMMUNOLOGY*
  VONHOEGEN, I., Nakayama, E., Parnes, J. R.
  1990; 144 (12): 4870-4877
- **EQUIVALENCE OF HUMAN AND MOUSE CD4 IN ENHANCING ANTIGEN RESPONSES BY A MOUSE CLASS-II-RESTRICTED T-CELL HYBRIDOMA** *JOURNAL OF EXPERIMENTAL MEDICINE*
  VONHOEGEN, P., Miceli, M. C., Tourvieille, B., Schilham, M., Parnes, J. R.
  1989; 170 (6): 1879-1886
- **SEQUENCE OF THE LYB-2 B-CELL DIFFERENTIATION ANTIGEN DEFINES A GENE SUPERFAMILY OF RECEPTORS WITH INVERTED MEMBRANE ORIENTATION** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Nakayama, E., VONHOEGEN, I., Parnes, J. R.
  1989; 86 (4): 1352-1356
- **MOLECULAR-BIOLOGY AND FUNCTION OF CD4 AND CD8** *ADVANCES IN IMMUNOLOGY*
  Parnes, J. R.
  1989; 44: 265-311
- **ROLE OF CD4 AND CD8 IN ENHANCING T-CELL RESPONSES TO ANTIGEN** *COLD SPRING HARBOR SYMPOSIA ON QUANTITATIVE BIOLOGY*
  Parnes, J. R., VONHOEGEN, P., Miceli, M. C., Zamoyska, R.
  1989; 54: 649-655
- **GENES ENCODING T-CELL ANTIGENS** *ANNALS OF THE NEW YORK ACADEMY OF SCIENCES*
  Parnes, J. R.
  1988; 546: 109-115
- **A 2ND CHAIN OF HUMAN CD8 IS EXPRESSED ON PERIPHERAL-BLOOD LYMPHOCYTES** *JOURNAL OF EXPERIMENTAL MEDICINE*
  Shiue, L., GORMAN, S. D., Parnes, J. R.
  1988; 168 (6): 1993-2005
- **A CD8 POLYPEPTIDE THAT IS LOST AFTER PASSING THE GOLGI BUT BEFORE REACHING THE CELL-SURFACE - A NOVEL SORTING MECHANISM** *EMBO JOURNAL*
  Zamoyska, R., Parnes, J. R.
  1988; 7 (8): 2359-2367
- **RESCUE OF DAUDI CELL HLA EXPRESSION BY TRANSFECTION OF THE MOUSE BETA-2-MICROGLOBULIN GENE** *JOURNAL OF EXPERIMENTAL MEDICINE*
  Seong, R. H., CLAYBERGER, C. A., KRENSKY, A. M., Parnes, J. R.
  1988; 167 (2): 288-299
- **L3T4 AND THE IMMUNOGLOBULIN GENE SUPERFAMILY - NEW RELATIONSHIPS BETWEEN THE IMMUNE-SYSTEM AND THE NERVOUS-SYSTEM** *IMMUNOLOGICAL REVIEWS*
  Parnes, J. R., Hunkapiller, T.
  1987; 100: 109-127
- **STRUCTURE OF THE MOUSE GENE ENCODING CD4 AND AN UNUSUAL TRANSCRIPT IN BRAIN** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  GORMAN, S. D., Tourvieille, B., Parnes, J. R.
  1987; 84 (21): 7644-7648