

## Contents

### Preface

xi

### I. Establishing new cell lines and characterizing molecular biological properties of cultured cells

#### Stress-inducible gene expression in fish cells

M. Yamashita

1

#### Cell culture and some properties of fish immunocytes

T. Watanabe, and T. Moritomo

5

#### Telomerase regulation in differentiated serum-free mouse embryo cells

Y. Katakura, K. Yamamoto, O. Miyake, E. Nakata, T. Yasuda, N. Uehara, D. W. Barnes, and S. Shirahata

11

#### Immortalization of mammalian central nervous system stem cells from p53 knock-out forebrain

T. Hisatsune, K. Yamada, R. D. G. McKay, and S. Kaminogawa

17

#### Neuroprotective function of erythropoietin in the central nervous system

S. Masuda, M. Chikuma, E. Morishita, M. Nagao, and R. Sasaki

23

#### Selection and stability for a recombinant CHO cell line expressing human GM-CSF in gene amplification

T. Omasa, S. Itami, D. Kameoka, Y. Katakura, and K. Suga

29\*

#### Effect of culture conditions on glycosylation in hybridoma antibody production

T. Omasa, J. Tanaka, K. Amimoto, Y. Katakura, and K. Suga

35

#### Antisense Rb RNA inhibits *in vitro* myogenic differentiation in a myoblast cell line, C2

M. Kobayashi, Y. Yamauchi, and A. Tanaka

41

#### Establishment of a stable hGH producing Verots S3 transformant

A. Sato, N. Nomura, K. Saijo, T. Ohno, and M. Matsumura

45

#### Characterization of an antigen-producing cell line huGK-14 at the molecular level

N. Nakamichi, A. Noda, T. Yonezu, K. Koike, and T. Matsumura

51

#### VJ rearrangement at previously excluded Ig $\lambda$ allele in human plasma cell line NAT-30

H. Haruta, S. Shirahata, and H. Tachibana

59

### II. Effect of various substances on animal cell response

#### Rational drug design using mammalian cell lines expressing site-directed mutants of the human H1 histaminic receptor

N. Moguilevsky, E. Differding, M. Gillard, and A. Bollen

65

|                                                                                                                                                                                                                                                                                                                                                                                                                               |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Biological response of endothelial cells : modulation of adhesion and multiplication by cytokines and prospects for the production of a vaccine against the rickettsia <i>Cowdria ruminantium</i> .<br>T. Marique, D. Blankaert, A. Raschella, V. Hendrick, B. Declerck, I. Teixeira-Guerra,<br>N. Vachier, P. Totte, C. Alloin, M. Cherlet, P. Zilimwabagabo, D. Parent, C. Kirkpatrick,<br>J. P. Van Vooren, and J. Wérenne | 71  |
| Effects of chemicals on immune response<br>A. Ametani, H. Watanabe, S. Hachimura, K.-Y. Lee, and S. Kaminogawa                                                                                                                                                                                                                                                                                                                | 77  |
| Molecular mechanisms of <i>Selaginella tamariscina</i> for antineoplastic activity in human leukemia cell line U937<br>I. S. Lee, S. U. Kim, Y. S. Lee, S. H. Park, and I. J. Rhee                                                                                                                                                                                                                                            | 83  |
| Differential effect of antigen analogs with T cell inhibitory activity on <i>in vivo</i> antibody response<br>M. Toda, M. Totsuka, T. Yoshioka, A. Ametani, and S. Kaminogawa                                                                                                                                                                                                                                                 | 91  |
| Increase of intracellular $Ca^{2+}$ level induces osteoclast-like cell formation in cocultures of mouse bone marrow cells and osteoblastic cells<br>M. Takami, J.-T. Woo, and K. Nagai                                                                                                                                                                                                                                        | 97  |
| New angiogenesis inhibitors of microbial origin<br>T. Shibata, T. Otsuka, H. Terano, and M. Okuhara                                                                                                                                                                                                                                                                                                                           | 103 |
| Hydrocortisone induces a formation of basophilic granules in the human leukemia cell line KU812<br>T. Hara, S. Shirahata, and H. Tachibana                                                                                                                                                                                                                                                                                    | 109 |
| Cytotoxicity testing of tomatine<br>D. Kozuka, S. Yamashoji, Y. Chiba, and K. Isshiki                                                                                                                                                                                                                                                                                                                                         | 115 |
| * Mannosylerythritol lipid induced differentiation of human myelogenous leukemia cell line K-562<br>H. Isoda, H. Shinmoto, D. Kitamoto, M. Matsumura, and T. Nakahara                                                                                                                                                                                                                                                         | 121 |
| * Coffee's inhibitory action on the invasion of hepatoma cells co-cultured with mesothelial cells<br>T. Furuse, H. Shiomi, Y. Miura, and K. Yagasaki                                                                                                                                                                                                                                                                          | 127 |
| Inhibitory effects of tea catechins on invasion of human fibrosarcoma HT1080 cells to the monolayer of human umbilical vein endothelial cells<br>M. Maeda-Yamamoto, K. Osada, Y. Yamaguchi, and K. Tsuji                                                                                                                                                                                                                      | 131 |
| Norzoanthamine suppresses PTH-stimulated IL-6 production <i>in vitro</i> and bone resorption <i>in vivo</i><br>T. Tsuji, K. Yamaguchi, M. Yada, K. Yamada, and D. Uemura                                                                                                                                                                                                                                                      | 137 |
| * Preparation and biological activities of the high molecular weight substances from dried safflower petals<br>T. Wakabayashi, T. Kataoka, J.-T. Woo, and K. Nagai                                                                                                                                                                                                                                                            | 143 |

### III. Basics and applications in immunology

- Characterization of human T cell clones isolated from immortalized T cell lines generated by oncogene transfection  
S. Alam, Y. Katakura, and S. Shirahata 149
- \* Acquired autoantibodies from human plasma B cells by light chain shifting  
S. Thongpassano, S. Shirahata, and H. Tachibana 155
- Clinical application of anti-carcinoma human monoclonal antibody  
K. Koda, M. C. Glassy, and N. Nakajima 161
- Some properties of bispecific antibodies to bovine lactoferrin and horseradish peroxidase secreted by a hybrid-hybridoma HH1-4-3  
H. Shinmoto, M. Kobori, T. Tsushida, and K. Shinohara 165
- Development of an ELISA based assay for measuring glycosyltransferase activity using synthetic glycopolymers  
M. Oubih, K. Kitajima, K. Kobayashi, T. Adachi, N. Aoki, and T. Matsuda 171
- \* Concanamycin A, a vacuolar type H<sup>+</sup>-ATPase inhibitor, selectively induces cell death in activated CD8<sup>+</sup> CTL  
K. Togashi, T. Kataoka, and K. Nagai 177

### IV. Technology and engineering for cell culture

- Yield improvements utilising fed-batch cultivation and optimisation strategies  
C. S. Sanderson, C. P. Marquis, and D. J. Barford 183
- Quality aspects of batch animal cell cultivation - relevance to fed-batch implementation in industry  
D. J. Black, J. P. Barford, and C. Harbour 191
- Technical approaches to minimize regulatory hurdles to fed-batch and continuous medium supplementation  
D. W. Jayme, R. M. Fike, S. F. Gorfien, and G. P. Godwin 197
- The use of biosensors in control of fed-batch processes - opportunities and limitations  
R. Renneberg, J. P. Barford, and S. M. (Anita) Tse 203
- Metabolic systems engineering approach for *Saccharomyces cerevisiae* and hybridoma cell culture  
K. Ye, H. Shi, and K. Shimizu 211
- \* Adaptive fuzzy control of mammalian cell culture in fed-batch reactor for production of an antithrombin III variant  
P. Lenas, T. Kitade, H. Watanabe, H. Honda, and T. Kobayashi 217

|                                                                                                      |     |
|------------------------------------------------------------------------------------------------------|-----|
| Cost-saving design and operational options for large-scale production of nutrient medium and buffers |     |
| D. Jayme, J. Kubiak, R. Fike, S. Rashbaum, and S. Smith                                              | 223 |
| Effect of shear stress on the rCHO cells                                                             |     |
| M. Motobu, P. C. Wang, and M. Matsumura                                                              | 229 |
| Quail embryo culture using artificial vessels                                                        |     |
| S. Oguchi, M. Kamihira, and S. Iijima                                                                | 235 |
| * Enhancement of transfection efficiency using ligand-modified lipid vesicles                        |     |
| J. You, M. Kamihira, and S. Iijima                                                                   | 241 |
| Recombinant protein production by CHO cells cultured in a chemically defined medium                  |     |
| S. F. Gorfien, J. L. Dzimian, M. L. Tilkins, G. P. Godwin, and R. Fike                               | 247 |
| Removal and inactivation of parvovirus from protein solution by a BMM membrane filter                |     |
| S. Shimokubo, T. Sato, G. Ishikawa, S. Satoh, K. Yamaguchi, and N. Yamamoto                          | 253 |

## V. Animal cell culture for transplantation and development of artificial organs

|                                                                                                            |     |
|------------------------------------------------------------------------------------------------------------|-----|
| Matricrine effect of basement membrane components on de novo formation of mesenchymal tissues              |     |
| N. Kawaguchi, E. Nicodemou-Lena, K. Toriyama, S. Torii, and Y. Kitagawa                                    | 261 |
| High-cell-density suspension perfusion culture of porcine hepatocyte spheroids for a bioartificial liver   |     |
| Y. Sakai, K. Naruse, I. Nagashima, T. Muto, and M. Suzuki                                                  | 265 |
| Cold-inducible gene expression in fish cells                                                               |     |
| M. Yamashita, N. Ojima, and T. Sakamoto                                                                    | 271 |
| <i>Drosophila</i> cell lines as the source of basement membrane components                                 |     |
| C. Kumagai, M. Azimi, T. Kadowaki, and Y. Kitagawa                                                         | 275 |
| The binding effect of immune complex by rat renal glomerular epithelial cell expressed with human CR1 gene |     |
| P. C. Wang, S. Kimura, Y. Gao, and M. Matsumura                                                            | 279 |
| * Preparation and characterization of DNA/anti-DNA antibody immune complex using monoclonal antibodies     |     |
| Y. Gao, P. C. Wang, A. Tajima, K. Yasuda, and M. Matsumura                                                 | 285 |
| * Morphology and function of rat hepatocytes cultured on expanded polytetrafluoroethylene surface          |     |
| T. Tokiwa, J. Kano, X.-Y. Meng, M. Kodama, and T. Matsumura                                                | 291 |

|                                                                                                                                 |     |
|---------------------------------------------------------------------------------------------------------------------------------|-----|
| Evaluation of ectopic bone formation by demineralized allografts in 0.6HCl using a controlled-heat ultrasonic cleaner           |     |
| H. I. Shin, C. J. Kim, H. J. Jang, and S. H. Lee                                                                                | 295 |
| Reorganization of vascular wall cells <i>in vitro</i> -effect of VEGF gradient-                                                 |     |
| K. Furukawa, T. Ushida, and T. Tateishi                                                                                         | 301 |
| Effects of cell morphology on expression of liver specific function and hormone response in primary hepatocyte culture          |     |
| R. Hamamoto, K. Yamada, M. Kamihiro, and S. Iijima                                                                              | 307 |
| <br><b>VI. Efficient production of protein and virus<br/>by cultured animal cells</b>                                           |     |
| HIV vector mediated gene transfer into CD4 positive cells                                                                       |     |
| T. Shimada, and K. Miyake                                                                                                       | 313 |
| * Enhancement of cellular productivity for a recombinant protein by a combination of promoter activation and gene amplification |     |
| X.-Y. Dong, Y. Katakura, Y. Zhang, T. Miura, Y. Daimon, H. Ohashi, and S. Shirahata                                             | 319 |
| * A tetracycline regulated recombinant protein production system                                                                |     |
| Y. Zhang, Y. Katakura, and S. Shirahata                                                                                         | 325 |
| * Improvement of transient protein production by COS-1 cells stably overexpressing <i>bcl-2</i> gene                            |     |
| T. Fujita, S. Terada, H. Ueda, and E. Suzuki                                                                                    | 331 |
| Effect of cytokines on growth of a mouse hybridoma cell line and its antibody production                                        |     |
| S. Terada, F. Makishima, H. Ueda, and E. Suzuki                                                                                 | 337 |
| Effect of hypoosmotic stress on hybridoma cell growth and antibody production                                                   |     |
| J. S. Ryu, and G. M. Lee                                                                                                        | 343 |
| Development of high output expression vectors for antibody production in mammalian cells                                        |     |
| C. Gervais, D. Paquette, A. Burnstardif, L. Martin, and B. Massie                                                               | 349 |
| * Magnetoliposomes as intracellular heat stress mediators for the temperature sensitive expression of cytokine                  |     |
| I. A. Bouhon, M. Shinkai, H. Honda, and T. Kobayashi                                                                            | 355 |
| Effect of ammonium ion on glycoform of erythropoietin produced by recombinant CHO cells using lectin-blotting technique         |     |
| K. H. Chang, K. S. Kim, and J. H. Kim                                                                                           | 361 |
| Effect of cloned gene dosage on the expression level and stability of chimeric antibody producing CHO cells                     |     |
| S. J. Kim, N. S. Kim, H. J. Hong, and G. M. Lee                                                                                 | 367 |

|                                                                                                                                                                                                                                    |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| A novel approach to prepare appropriate antibodies for immunoaffinity chromatography<br>A. Enomoto, N. Kamata, J. Kurisaki, K. Nakamura, and N. Shiragami                                                                          | 373 |
| Characterization of monoclonal antibodies produced by hybridoma cell lines prepared against hepatitis B virus X protein<br>M.-K. Chung, H. G. Lee, E. S. Oh, S.-S. Min, H. K. Lee, T. G. Lee, J. S. Lim, C. M. Kim, and S. N. Park | 379 |
| Cultured-animal-cell assay for collagen-synthesis-activation factor produced by callus of woody plant <i>Eucommia ulmoides</i><br>A. Ono, X.-H. Xing, and H. Unno                                                                  | 385 |
| Author Index                                                                                                                                                                                                                       | 391 |
| Subject Index                                                                                                                                                                                                                      | 395 |

**\* Papers related to the subjects will be published in *Cytotechnology* specially issued for JAACT'96 in the more extended form.**