Subject Index

Acid phosphatase: Cytochemical demonstration of 29, 32, 44 In normal blood cells 28, 44 In stem cell leukemia 32 In Di Guglielmo's Syndrome 44 Actinomy cin D: Inhibition of RNA-synthesis by 297 ADP-ribosyl-TF II 308, 311 Binding to ribosomes 308 Adriamy cin: Therapy with 6 Agar colony technique 51, 62, 76 Alkaline phosphatase: Cytochemical demonstration of 29 Alpha-amanitin: Inhibition of RNA polymerase by 256 Alpha-naphthylacetate-esterase (α -N-Esterase): Cytochemical demonstration of 29, 44 Aminoacyl-tRNA Synthetases 314, 318 Aminopterin: Therapy with 6 Anisomy cin 24 Inhibition of protein synthesis by 25, 328–336 Antibiotics: Inhibition of protein synthesis by 25, 328–336 Antibodies: To EA (EBV-induced early antigen complex) 129 To MA (EBV-associated cell membrane antigen complex) 129, 130 To primate type C virus reverse transcriptase 191, 194, 346, 349 To Rauscher Virus 120–125 To surtace IgM 98, 100 To surface Ig, peroxidase labelled 104 To tryptophan oxygenase 296 To VCA (EB viral capsid antigen complex) 130 Antibody-forming cells: Electrophoretic mobility of 74 Antigen: Tumor associated 9, 107 Tumor specific surface 9, 33

reaction to 109, 111 On JLSV9 Rauscher Virus infected cell 120-123 Antisera: To DNA polymerase I 195 To Mason-Pfizer Monkey Virus DNA polymerase 207, 214 Inhibition of HeLa Virus DNA polymerase by 213 To reverse transcriptase from RNA tumor viruses 194, 195 Inhibition of human leukemic reverse transcriptase by 191 Anti-tumor-drugs 9 Asparaginase: Therapy with 6 Ataxia teleangiectasia: Chromosomal instability in 94 Incidence of leukemia in 231 Auer rods 29, 38 ApUpG codon 320, 324 Avian leukosis sarcoma viruses 135, 145 Classification of 145 RNAs of 133, 145 Nondefective 133, 145, 152 Replication defective 133, 142, 145 Transformation defective 135, 145, 152 a and b subunits of 136–140, 145 **Balb** /c cells 150–153 Virus production in 151 BCG treatment 9, 129–131 Bloom's syndrome 94 Chromosomal instability in 94 Leukemia and 231 B Lymphocytes: see Lymphocytes Bone marrow: Cell differentiation in 11, 27, 51, 61 Electrophoretic distribution profiles of 76

On myelogenous leukemia cells, skin

Growth of, in diffusion chambers 79 Leukemic cells in 13, 27 Normal cells in 11, 27

Transplantation of 350

- BrdU (5-bromo-2deoxyuridine) Virus production induced by 151,
- 152, 198 Bryan RSV 135, 142, 143
- Budding 149, 153
- Burkitt's lymphoma 129, 167
 - BCG inoculation in patients with 130 Epstein Barr virus associated antibodies in 129, 130
 - Hybridization of recycled Hodgkin's DNA to nuclear DNA of 172
 - Simultaneaous detection test in 167–171

Reverse transcriptase in 167–171

- Calf-thymus terminal nucleotidyl transferase 251
- Cell culture, see cell line in culture, agar gel colony, millipore diffusion chamber Cell differentiation: Of blood cells 11,
- 51, 61, 227 Cytochemical markers in 29 In leukemia 13, 31, 57, 61–63, 228 Of leukemic cells in culture 57, 65
- Of Friend Cirus leukemia cells 278
- Cell-free extracts: Of E. coli 270 Of human lymphatic tissue 308, 327 Of Krebs ascites cells 288, 293 Of wheat germ 290
- Cell kinetics 11–15, 52
- Cell-free protein synthesis system, see cell-free extracts
- Cell-free system, see cell-free extracts
- Cell lines in culture: Friend Virus leukemia 278
 - Human hematopoietic 85
 - Human lymphoid 109, 114
 - Membrane extracts of human lymphoid 112
- Cell membrane: Surface bound immunoglobulins 91–110, 104

racteristics 342, 344 Cell proliferation 11, 51 Cell separation 74, 258 Cell surface, see antibodies and antigen Cell transformation: In vitro, of polycythemia vera bone marrow 85 Of friend Virus leukemic cells 278 Cellular immunity: Assays of, in human acute leukemia 107 Chromosomes: In leukemias 56, 94, 343 Marker 56, 94 Philadelphia 11, 94, 343, 349 In polycythemia vera cells 86 Radiosensitivity of 95 Chromosomal: Aberration 95 Breakage 95 Change in leukemia 343 Instability 94–96 Marker in leukemia 343 Codon 20 ApUpG 324 Colony forming cells (CFC) 12, 51, 60 Effect of RLV infection on 68, 69 Electrophoretic mobility of 76 From murine leukemic cells 70 In leukemia 65, 77, 81 Colony forming units (CFU) 50, 60, 67, 69 Effect of RLV infection on 67 Electrophoretic mobility of 76 Colony stimulating factor (CSF) 12, 51, 53, 60, 62, 64, 350 Effect of 52, 55 Effect on leukemic cells 60 Effect of endotoxin on 53 In vivo effect of 350 Production of 54 Colony stimulating activity (CSA), see CSF

Cell Maturation and cell membrane cha-

Cordycepin: Inhibition of poly (A) synthesis by 153

Corticosteroids: Stimulation of virus production by 153, 198–204

⁵¹Cr release cytotoxity assay in acute

leukemia 114–116

- C-type virus, see type-C-RNA tumor virus Cycloheximide: Inhibition of protein synthesis by 25
 - Cytochemical markers in cell differentiation 29
- Cytochemical reactions in blood cells 21, 31, 40
- Cytokinetics (s. cell kinetics)
- Daunomycin: Therapy with 6

Dexamethasone, see corticosteroids

- Diffusion chamber, see Millipore diffusion chamber
- Dimethyl-sulfoxide (DMSO): Stimulation of erythroid differentation of leukemic cells by 279, 281
- Diphtheria toxin: Inhibition of protein synthesis by 25, 302, 308

DNA 20 Double-stranded, syntheses by reverse transcriptase 347

DNA hybridization: With Hodgkin's disease (3H)DNA 172 With leukemic (3H)DNA 347

DNA polymerase 247 In human acute lymphoblast cells 250 In human infant thymus 252

Of chick tissues 254

- RNA-dependent (s. reverse transcriptase) RNA-directed (s. reverse transcrip-
- tase) DNA dependent RNA polymerase 20
- DNA dependent RNA polymerase 20, 248
- DNA provirus 224
- DNA sequences in human leukemic cells 347
- DNA template 21

Down's Syndrome (s. mongoloids)

- Drugs in human leukemia 6, 9
- E. coli: Translation of viral RNA in cellfree extracts of 270

Electron microscopy: Demonstration of surface IgM on lymphosarcoma cells by 100 In Di Guglielmo's Syndrome 46 Of Hairy cell leukemia 104 Of leukemic cells 37, 43 Of transformed polycythaemia vera cells 91 Electrophoretic mobility and colony forming units 76 Electrophoretic separation of hemopoietic cells 74 Elongation 308, 325, 329 Inhibition of 329 Elongation factors 308, 327 EMC-viral RNA: Translation in frog oocytes 272 Endotoxin and colony stimulating factor 53 Epsein-Barr-Virus (EBV) 129 EBV-associated antobodies 129 In Burkitt's lymphoma patient sera 130 Ergastoplasm 26 Esterase: Alpha-N-, cytochemical demonstration of 30 N-AS-D-Cl-, cytochemical demonstration of 30, 39 Erythremia: Acute 42 Erythroblasts 29 In Di Guglielmo's Syndrome 46 Erythroid cells 11 Erythroleukemia 42 Sideroblasts in 42 Erythroleukemic cell 279 Erythepoiesis 51 Erythropoietin 51, 62 Eukaryotic cells 290 Ribosomes in 327, 330

Fanconi anemia: Chromosomal instability in 94
Ferritin: Cytochemical detection of 33
Fingerprint: Of RNase T₁ digest of sarcoma virus RNAs 136, 137–139 Folic acid antagonists 6 Fragment reaction: By human tonsil and yeast ribosomes 333 Friend Virus induced mouse leukemia 84, 278, 345 Friend Virus leukemia cells: Differentiation of 278 Differentiation by DMSO 267, 279 Differentiation by etiocholanolone 285 Globin mRNA in 279, 281 Hemoglobin synthesis in 278 RNA-polymerase in 262 Synthesis of cytoplasmatic RNA in 285 tRNA methylases in 265 Frog oocytes: Translation of 9S RNA in 275, 281 Translation of Hb mRNA in 275 Translation of viral RNA in 273

G-chromosome 94 Gene: Cellular 145 Transforming 145 Expression of 20 Viral 347 Genetic code 20, 21 Genetic factors in leukemia 230 Genetic information 20, 133, 144, 151 Nucleic acid molecules in 20 In tumor virus RNA 133, 145, 151 Genome: Viral 134 Gibbon ape lymphosarcoma virus 194 Globin: α and β chains of 29, 277, 278 Globin mRNA 275 In leukemic cells 29 Translation of, in cell-free extracts 275, 290, 304 Globin synthesis 278 mRNA directed, in frog oocytes 32, 275, 282 In polycythaemia vera cells 85 Glucocorticosteroids, see corticosteroids Golgi-fields in leukemic cells 36 360

Haemin: Stimulation of globin synthesis by 300 Hairy-cell leukemia, 46, 103, 104 Immunoglobulin receptors in 48, 101, 103 Hela cells: Oncorna virus like particle in 206Simultaneous detection test in 209 Helper virus 152 Hemoglobin, see globin Hemopoiesis 51 Hemopoietic stem cells: Assay of 62 Hodgkin's disease: Hybridization of (³H)DNA with RLV-RNA 167 Hybridization of (³H)DNA with nuclear DNA 174 Hot spot hypothesis 230, 347 Genetic factors and model, of 233 Hybridization: Of heterogenous nuclear RNA to lymphocytes' and leukemic cells' DNA 243 Of Hodgkin's disease (³H)DNA to nuclear DNA 172 Of human leukemia (³H)DNA to nuclear DNA 347 Of human leukemia (³H)DNA to 70S viral RNA 193 Of human lymphoma (³H)DNA with RLV RNA 167 Of RLV (³H)DNA to human leukemia **RNA 158** Immune response to Rauscher leukemia

- virus 120, 124
- Immunity: Assays of cellular 107
- Immunity system: Cellular 108
- Immunization with formalinized RLV 120 - 123
- Immunoferritin method 33
- Immunofluorescence: Reaction of EBVassociated cell membrane antigen complex 130
- Immunoglobulin receptors of cell membranes 48, 100
- Immunoglobulins: Demonstration by

peroxidase labelled antibodies 100 Surface-bound, in leukemia 97 Surface-bound IgM 100, 101, 105 Immunotherapy in acute leukemia 9, 116 Infection: Granulocytopenia in 8 Influenza virus: Defective viral RNAs in 145 Inhibition assay: Leukocyte migration 115 Inhibitors: Of DNA polymereses 216 Of protein synthesis 24, 304, 308, 327-330 Of reverse transcriptase 151, 216 Initiation 80S complex 304 Intitiation factors 24, 313 Reticulocyte 292 Karyotype: In polycythaemia vera cells 86 In leukemias 94 Kinetic: Of blood cells 12 Of leukemia cells 13 Kirsten murine sarcoma virus (Kirsten MSV) 133, 134, 143 Labelling index 16 Leukemia: Acute lymphoblastic 6, 31, 44, 107, 109, 110 Acute myeloblastic 31, 133 Acute myelocytic 55, 344 Acute myelomonocytic 39 Cellular immunity in human acute 107 Chronic lymphocytic 97, 100 Chronic myelocytic 344 DNA polymerase, DNA dependent in 249,256 Friend virus 84, 265–267, 344 Hairy-cell 47, 103 In identical twins 228 Methothrexate in 6–9 Monocytic 39 Murine 120, 151 Rauscher 119 Reverse transcriptase in 15, 160, 176, 185, 229, 342

RNA-polymerase in 260 Terminal nucleotityl transferase in 249 tRNA methyltransferases in 265 Leukemic cells 27, 30, 55, 154, 164, 350 Culture of 64 Differentiation of 13, 31, 37, 61-63, 228 Leukemic: DNA 347 Erythroblasts 30 Lymphoblasts 30 Leukocytes 159 Monocytes 30 Myeloblasts 30 Plasma pellet 177–178 RNA directed DNA polymerase in 178 70S RNA in 178 Leukemogenesis: Human 66 Leukocytes see neutrophil leukocytes Migration inhibition assay of 115 Mixed culture of 116 Leukemoid reaction 345 Leukosis see leukemia Avian virus 134, 145 Lymphocytes: B- 48, 74, 105 blastogenic responses to RLV of 121, 122 Cytotoxicity of 115, 116 Electrophoretic mobility of 74 in vitro culture of 121 PHA-stimulated 121 Stimulation of, in leukemia 108, 116, 121 Terminal nucleotityl transferase in 251 Lymphoma: Human 129, 164 Reverse transcriptase in 165 70S RNA-(³H) DNA in 166 RNA tumor viruses in 157 Simultaneous detection of 70S RNA in 165 Lymphosarcoma: Reverse transcriptase in 165 Cells 99, 100

v.Magnus Virus 145 Mammalian mRNAs: Translation of 23, 204,291 Mammalian protein synthesis 24, 326 Marrow (s. bone marrow) Membrane, see cell membrane Mercapto-polycytidylic acid (MPC): Effect of DNA-polymerase 219, 221 Methotrexate: Therapy with 6 Millipore diffusion chamber: Growth of normal and leukemic human blood cells in 79 Mitochondria: Ferritin in 44 In leukemic cells 36 In lymphoblastic leukemia 44 Mitogens: Stimulation of lymphocytes by 108 Mixed leukocyte culture 116 Molecular hybridization, see hybridization Moloney murine sarcoma virus (MSV) 134 Mongoloids: Incidence of leukemia by 231 Monocytes: Enzymes in 40 Mononucleosis: 70S RNA (³H)DNA in white blood cells in 169 mRNA 20, 23, 29, 275, 293 Globin 275, 283, 286 For tryptophan oxygenase 298 Identification of 289 Mammalian 290 Translation of, see Translation Murine sarcoma virus 134, 144, 153 Myeloblastic leukemia, see myelogeneous leukemia Myeloblasts: Leukemic 30, 38, 344 (³H) DNA of, hybridization to 70S RNA from tumor viruses 193 Myelogeneous leukemia, see also leukemia 55, 227, 345 Chronic 344 RNA directed DNA polymerase in 180, 192 70S RNA in plasma of 178

Myeloid stemm cell 51 Myelopoiesis 50 Differentiation in 11, 51, 227 Regulation of 53, 55 Napthol-AS-D-chloroacetate-esterase: Cytochemical demonstration of 29, 31,40 Neoplasia, human: Etiology of 225 Oncorna virus related RNA in 175 Simultaneous detection test in 175 Neutrophil leukocytes: Enzymes in 40 Granules of 39 Releasing activity 51 Nonproducer: Viral information in 152 Nucleic acids, see DNA and RNA Oncogene theory 235 Oncogenic RNA viruses, see Virus Oocytes of Xenopus laevis: Translation of globin mRNA in 275, 282, 283 Translation of mRNA from human leukemic cells in 29 Translation of viral RNA in 272 **Operator 20** Operon model 20, 25 Oscillation in granulocyte count 52, 56 Parablasts see leukemic cells PAS reaction: In blood cells 30, 42, 46 Pelger-Huet anomaly 29 Peptidyl transferase 334 Peptidyl tRNA 310 Peroxidase: Reaction in blood cells 30 Labelled antibodies 98 Philadelphia chromosome 11, 55, 94,

343, 349 Phosphatase; see acid phosphatase and

alkaline phosphatase

Phytohemagglutinin stimulated lymphocytes 121, 237

Heterogeneous nuclear RNA in 239

Pluripotent hemopoietic stem cell 11, 50, 343 Poly (A) containing RNA: In heterogeneous nuclear RNA 241, 243
In virus RNA 148, 149
Purified from rat liver 294
Translation in Krebs ascites cell sy-

stem of 294 Synthesis of 153

Polycythaemia vera bone marrow cells: In culture 85, 92 Cytology and cytochemistry of 86 Globin synthesis in 85

Karyotype of 87, 88

Reverse transcriptase in 86

Transformation of 82

Virus-like particle in 92

- Polycytidylic acid: Effect on DNA-polymerase 219, 221
- Polymerase, see DNA and RNA polymerase
- Polypeptide chain elongation 24, 308

Polyphenylalanine synthesis 310 Directed by poly (U) 332, 336

- Polysomal RNA of mouse reticulocytes 280
- Polysomal profile 279
- Poly (U)-directed polyphenlalanine synthesis 332
- Prague Rous sarcoma Virus (PR RSV) 134
- Precursor cell for hemopoietic systems, see stem cell
- Prednisolone: Stimulation of virus production by 198
- Prednisone: Therapy with 6
- Primate type-C RNA tumor viruses 148
- Progenitor cells, see stem cells Prokaryotic ribosomes 327

Promotor 20

Protein synthesis, see cell free extracts Control of 24

Inhibitors of 328

Protovirus hypothesis 145, 235

Proviral genome 157, 225

Proviral information 151, 235

Provirus 149, 151, 224

Expression of, in normal and neoplastic human cells 225 Gene expression of 150, 225

Prussian blue-positive material in sideroblasts 42

Pseudo Pelger cell 27

Puromycin: Inhibition of protein synthesis by 24, 302, 305

Puromy cin reaction 322, 334

Rauscher Leukemia Virus 60, 120, 164 Antibody response after immunization with 124 Immune response after immunization with 124

Rauscher Leukemia Virus infection: Effect on colony forming cells 68, 69 Effect on colony forming units 67

Remission in leukemia 6, 7, 345 Leukemic DNA sequences in leukocytes during 347

Replication genes 133

Replication: Viral 153

Repressor 20

- Reticulocytes: Initiation factors in 295 Lysate 288, 300
- Reticulum cell sarcoma 37, 106, 165
- Reticulum cells: IgM in 102
- Reverse transcriptase: 15, 20, 22, 148, 151, 195, 224, 225
 - Detection of virus-like 150, 161
 - In Burkitt's tumors 167
 - In HeLa cell virus 209
 - Inhibition by antisera to C-type viru-
 - ses 191, 194, 213
 - Inhibiters of 217

In leukemic blood cells 160, 229, 341

- In normal chicken embryos 224
- In polycythaemia vera cells 86, 91
- Ribosomes 22

Binding of ³HADP-ribosyl TF II to 308 Binding sites of 24, 305, 312

-cycle 24

Eukaryotic 327, 330

Poly-phenylalanine systems of human tonsil 333 Prokaryotic 327 Puromycin reaction by 334, 336 40S subunit of 24, 330 60S subunit of 24, 330 Human tonsil 327, 331, 335, 336 Yeast 327, 336 Rieder cell type 29 Rifamycin SV: Inhibition of reverse transcriptase by 15, 151 Ribonuclease H 151 RNA, see also mRNA and tRNA EMC 303 Eukaryotic 303 Poly(A)-containing 293, 294 RNA heterogeneous: In leukemia cells 244 In PHA-stimulated lymphocytes 239 Poly (A)-rich 243, 244 RNA hybridization see hybridization RNA: Human leukemia specific 160, 180, 185, 192, 229 RNA polymerase 20 A and B 259 In Friend Virus murine leukemia cells 262 In Hodgkin's disease 260 In human leukocytes 260 In lymphatic leukemia 260 Purification of 261 RNA, translation of: In ascites cell system 288 In frog oocytes 272, 275, 279 In wheat system 290 RNA virus see virus Rous sarcoma virus (RSV) 151

Sarcoma, see virus Kirsten murine 133, 134 Murine 151 Reticulum cell 97 Rous 151 Simian sarcoma virus 194 364 Simultaneous detection test: In human leukemic leukocytes 160, 185 In human leukemic plasma 176 In human lymphomas 165 In human neoplasm 175 In oncorna virus-like particle of HeLa cells 209 In Polycythemia vera bone marrow cells 89 Skin tests in leukemia 108, 109, 112–114, 121 Sparsomycin: Inhibition of protein synthesis by 25, 302 Sulfide-silver reaction 29, 33 Stansly virus 278 Stem cells 61 Agar gel culture and 51, 62, 76 Assay of hemopoietic 62 Compartment of 11, 69, 343 Committed 51, 343 Electrophoretic mobility of 77 Hemopoietic 62 Maturation of 61 Multipotent 61 Murine 66 Philadelphia chromosome and 11, 343 Pluripotent, differentiation of 50, 343, 346 Spleen colony technique and 12, 62

T-cells 74, 108, 109 Template 152 "Oncogenic" RNA 167 -primer 66 Tenuazonic acid: Inhibition of protein synthesis by 333, 336 Therapy: And cell kinetic 16 Immuno 9, 116 In acute leukemia 6 Thymus: DNA polymerase in 252 Tobacco mosaic virus (TMV) RNA 290 Translation of 290 Transcriptase, see reverse transcriptase Transcription 21

Transfer RNA s. tRNA Translation 22, 271, 289, 294, 314 Translation of mRNA: In cell-free systems 289, 296, 300 In frog oocytes 29, 272, 275, 283 Translation of viral RNA 303 In cell-free extracts of E. coli 270 In frog oocytes 272 In wheat germ system 290 Translocation 24 Factors 309, 331 Transplantation of bone marrow 349 Treatment of leukemia 6 tRNA 23, 153, 289, 314, 315 Aminoacyl 24, 310, 325 Binding Factor 318, 324 Initiator 320 Methionyl- 24, 304, 315, 317, 322, 324 Peptidyl-24 Thiolated, effect of DNA polymerase by 222 tRNA methyl-transferases 158, 265 In Friend Virus mouse leukemia 265 In leukemia cells 264 In leukocytes 264 Tryptophan oxygenase, mRNA for 293, 295 Translation in Krebs ascites cell-free system of 294 Tuberculosis 344 Tumor virus, see Virus Twins, identical: Leukemia in 115, 228, 347 Type-B RNA virus 126 Type-C RNA tumor virus 126, 148, 228, 347 Components in normal tissues 228 Defective 231 Effect of steroid hormones on production of 204 Induction of leukemia by 230 In erythrocytes 70 In granulocytes 70 Primate 66, 126, 148, 165, 229

RNA primed-RNA directed DNA synthesis in 229 Vincristine: Therapy with 6 Viral genes 133–146, 348 Viral polymerase, see reverse transcriptase Viral RNA 347 In human neoplasia 164 In human tumors 164 Translation of 270, 272, 290, 304 Viral replication 153 Viral transformation 151 Virogene theory and human lymphomas 173 Virus: Avian RNA tumor 133, 148 Brome mosaic (BMV) 290 Bryan RSV 133, 135, 142, 143 Defective 145 Endogenous 151, 348 Helper 152 Hot spot Hypothesis 230–235 Induction by IDU 198 Incomplete 348 Influenza 145 Kirsten murine sarcoma 134, 143 Life cycle of RNA tumor 148 Mammalian RNA tumor 148 MC29 133, 143 Mouse mammary tumor 164 Murine 151 Murine leukemogenic 164 Particles 153 Plant 292 Primate type-C RNA tumor 66, 148 Production of 153 Progeny 133, 144 Rauscher leukemia 60, 120, 164 Replication 134 Replication defective RNA tumor 142 Rous sarcoma 151 Stansly 248 Tobacco mosaic 290 Type-B 126, 165 Type-C (s. type-C RNA tumor virus) 365

Wheat germ 288, 290 System 290 Translation of RNA in 290 Xenopus oocytes: Translation of RNA in 29, 272, 275, 288 Xeroderma pigmentosum: Leukemia in patients with 95