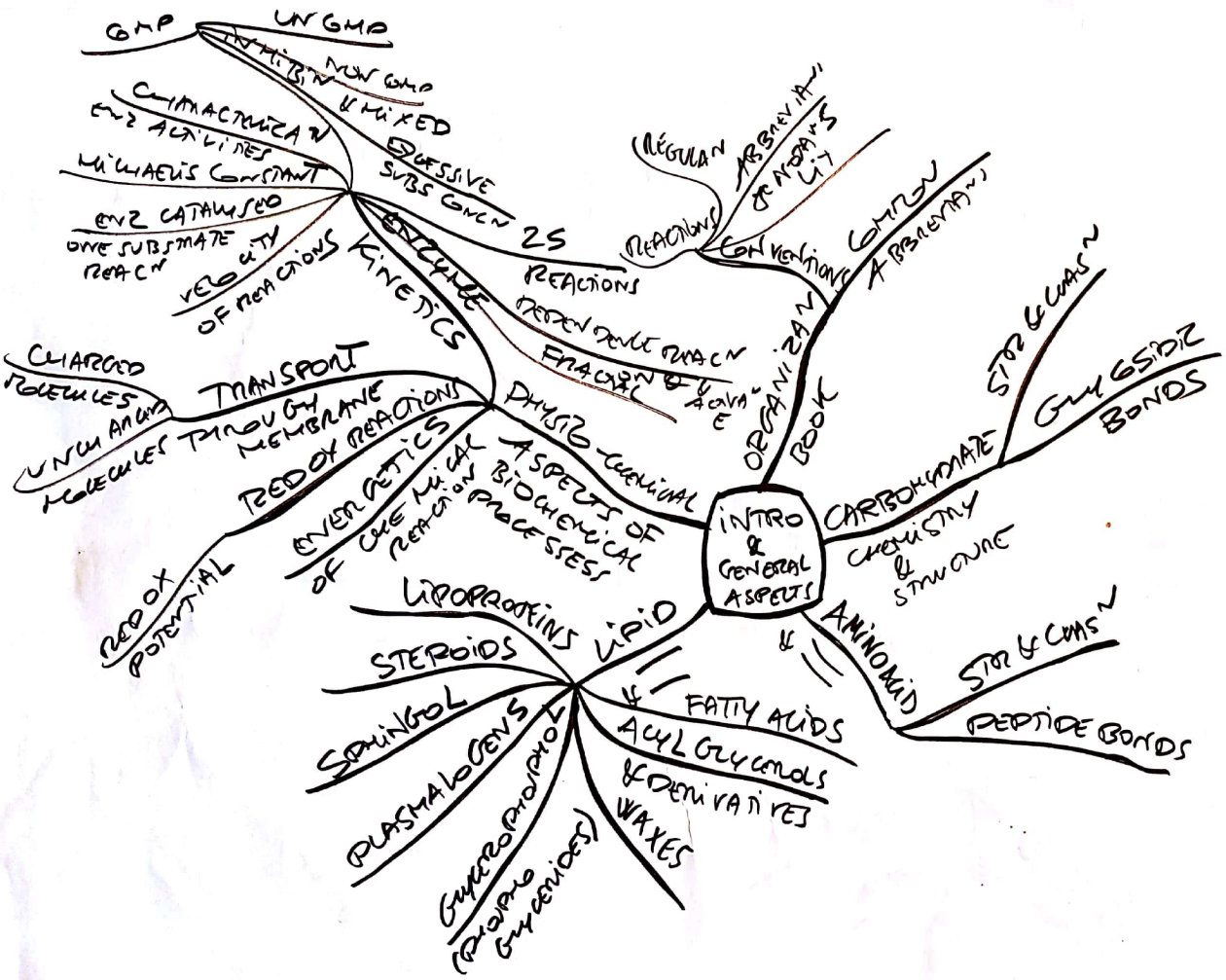
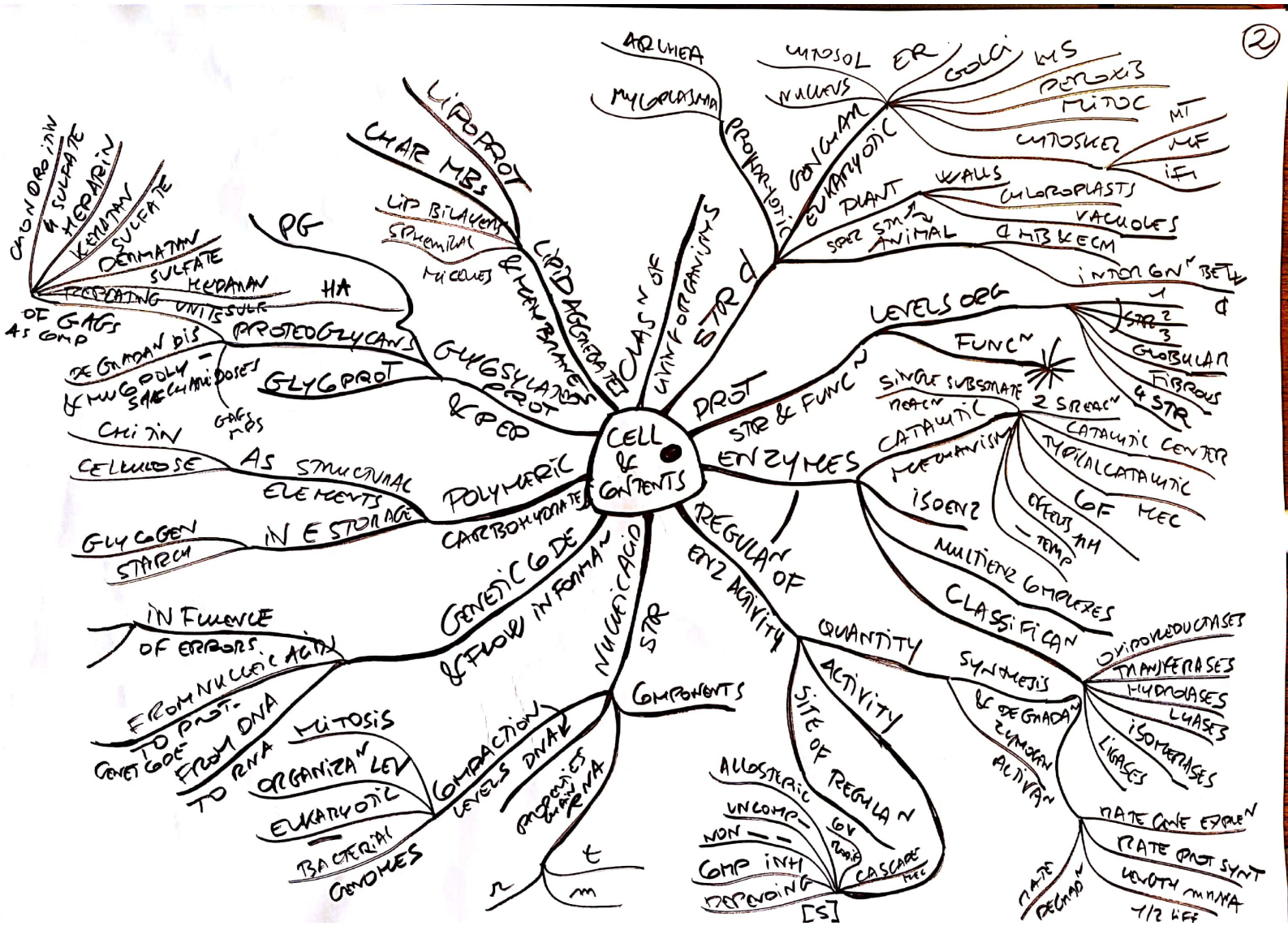
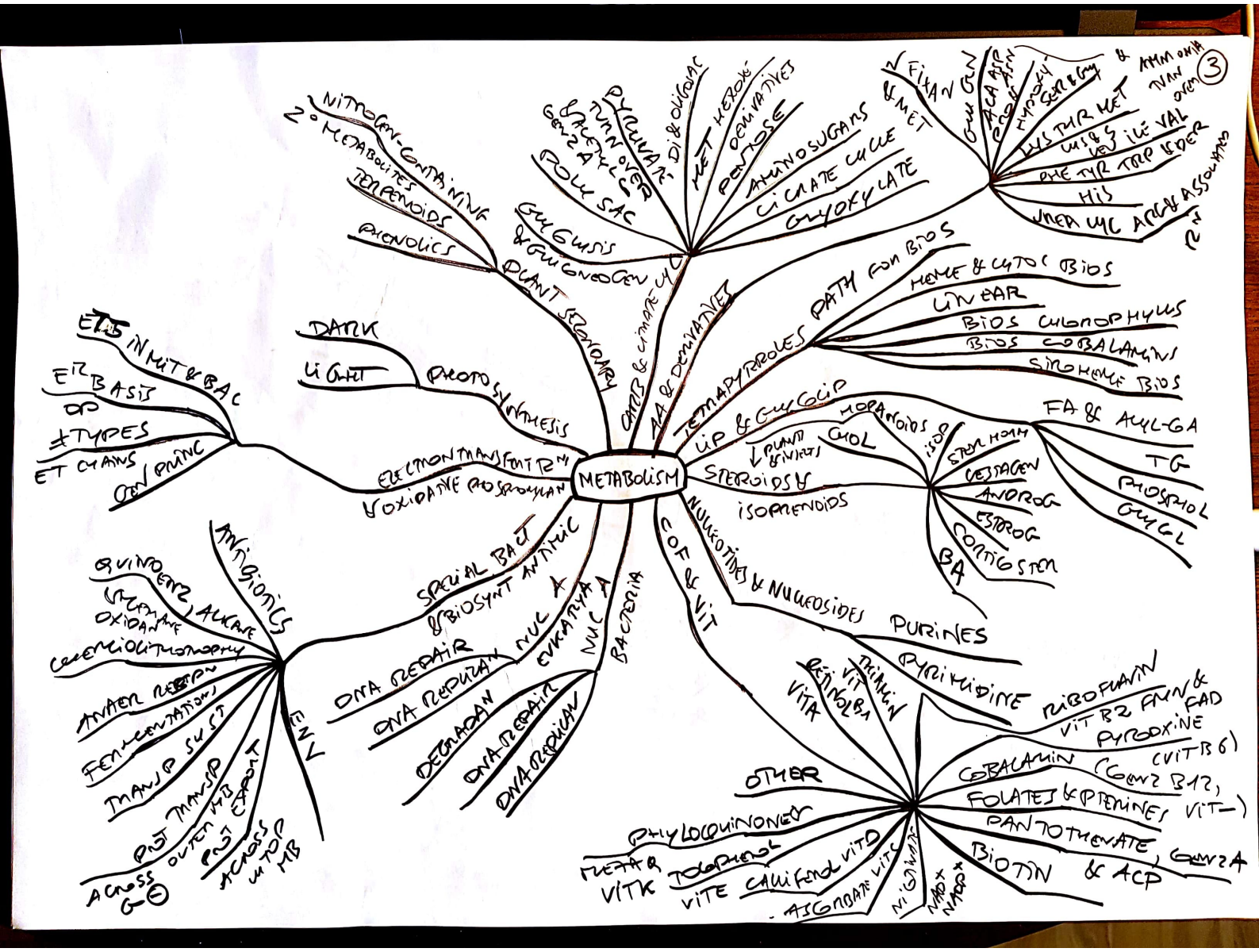
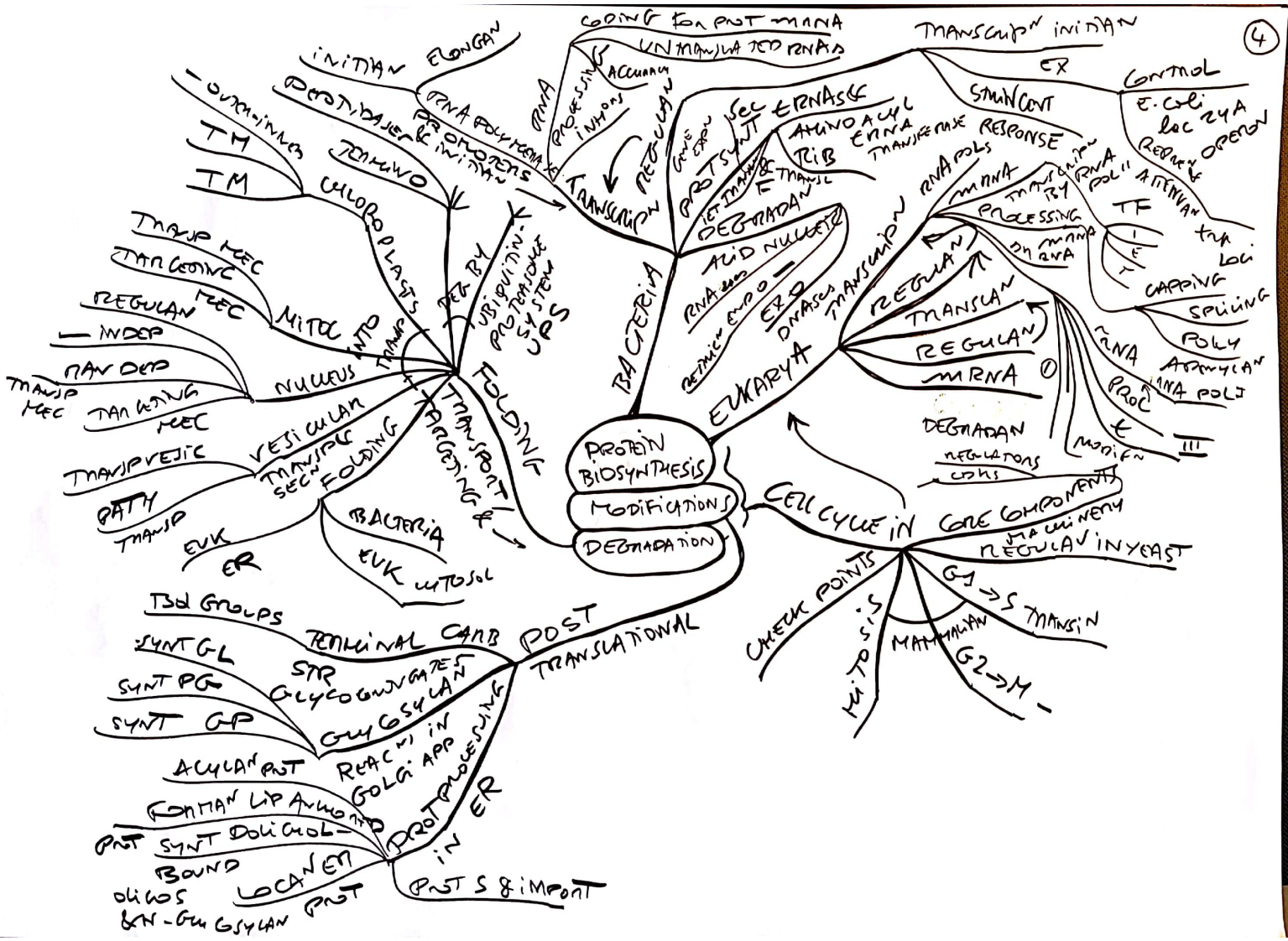
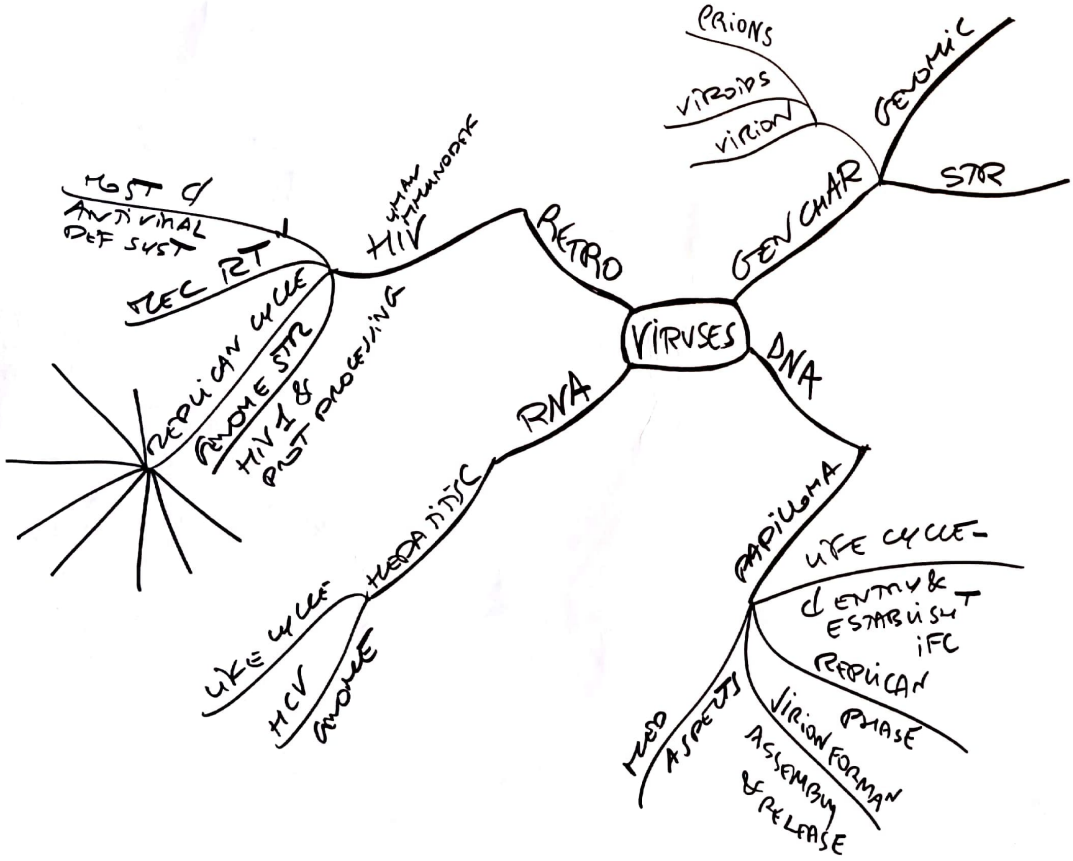

INTRO & GENERAL ASPECTS
ORGANIZATION
BOOK
CARBOHYDRATE
CHEMISTRY & STRUCTURE
STRUCTURE
GLYCOSIDIC BONDS
AMINO ACID
STRUCTURE
PEPTIDE BONDS
LIPID
FATTY ACIDS
ACYL GLYCEROLS & DERIVATIVES
WAXES
GLYCEROPHOSPHOLIPIDS (PHOSPHO GLYCERIDES)
PLASMALOGENS
SPHINGOL
STEROIDS
LIPOPROTEINS
PHYSIO-CHEMICAL ASPECTS OF BIOCHEMICAL PROCESSES
ENZYMATIC REACTIONS
REPRODUCIBLE REACTION
REACTIONS
ZS
REGULAR REACTIONS
ARBITRARY GENERALITY
CONVENTIONAL CONTROL ARRANGEMENT
ENZYME KINETICS
SUCCESSIVE SUBSTRATE
MIXED
NON GMP
INHIBITION
UNGMP
GMP
CHARACTERIZATION ENZ ACTIVITIES
MICHAELIS CONSTANT
ENZ CATALYSED ONE SUBSTRATE REACTION
VELOCITY OF REACTIONS
ENERGETICS OF CHEMICAL REACTION PROCESSES
REDOX REACTIONS
REDOX POTENTIAL
TRANSPORT THROUGH MEMBRANE
CHARGED MOLECULES
UNCHARGED MOLECULES


CELL & CONTENTS
PROKARYOTIC
ARCHAEA
MYCOPLASMA
EUKARYOTIC
CYTOSOL
ER
GOLGI
LYS
PEROXIS
MITOC
CYTOSKEL
MT
MF
IF
NUCLEUS
PLANT
WALLS
CHLOROPLASTS
VACUOLES
ANIMAL
CELL MBS & ECM
INTERCELL BETW
CELL
LEVELS ORG
FUNC
STR 2
STR 3
GLOBULAR
FIBROUS
4 STR
STR & FUNC
PROT
ENZYMES
SINGLE SUBSTRATE REACN
2 SUBSTRAT REACN
CATALYTIC MECHANISM
CATALYTIC CENTER
TYPICAL CATALYTIC
OF MEC
EFFECTS PH
TEMP
ISOENZ
MULTIENZ COMPLEXES
CLASSIFICAN
OXIDOREDUCTASES
TRANSFERASES
HYDROLASES
LYASES
ISOMERASES
LIGASES
SYNTHESIS & DEGRADAN
ENZYMOGEN ACTIVAN
RATE CONC EXPLAIN
RATE PROT SYNT
LENGTH MRNA
1/2 LIFE
RATE DEGRADAN
REGULAN OF ENZ ACTIVITY
QUANTITY
ACTIVITY
SITE OF REGULAN
LOV MOL
CASCADE REC
ALLOSTERIC
UNCOMP
NON
COMP INH
DEPENDING
[S]
STR
COMPONENTS
NUCLEIC ACID
COMPACTION LEVELS DNA
ORGANIZAN LEV
EUKARYOTIC
BACTERIAL GENOMES
MITOSIS
PROCESS PLASMA
GENETIC CODE & FLOW INFORMAN
FROM NUCLEIC ACID TO PROT
FROM DNA TO RNA
GENETI CODE
INFLUENCE OF ERRORS
CHAR MBS
LIPOPROT
LIP BILAYERS
SPHERICAL
MICELLES
LIPID AGGREGATES & MEM BILAYERS
CLASS OF UNIV ORGANISMS
STR
PG
HA
PROTEOGLYCANS
GLYCOSYLATED PROT
GLYCOPROT
& PEP
DEGRADAN DIS
OF HUG POLY SACCHARIDOSES
GAGS MOS
CHONDROITIN
4 SULFATE
HEPARIN
KERATAN SULFATE
DERMATAN SULFATE
KERATAN
REPEATING UNITS SULF
OF GAGS
AS COMP
CHITIN
CELLULOSE
AS STRUCTURAL ELEMENTS
POLYMERIC CARBOHYDRATE
GLYCOGEN
STARCH
IN E STORAGE

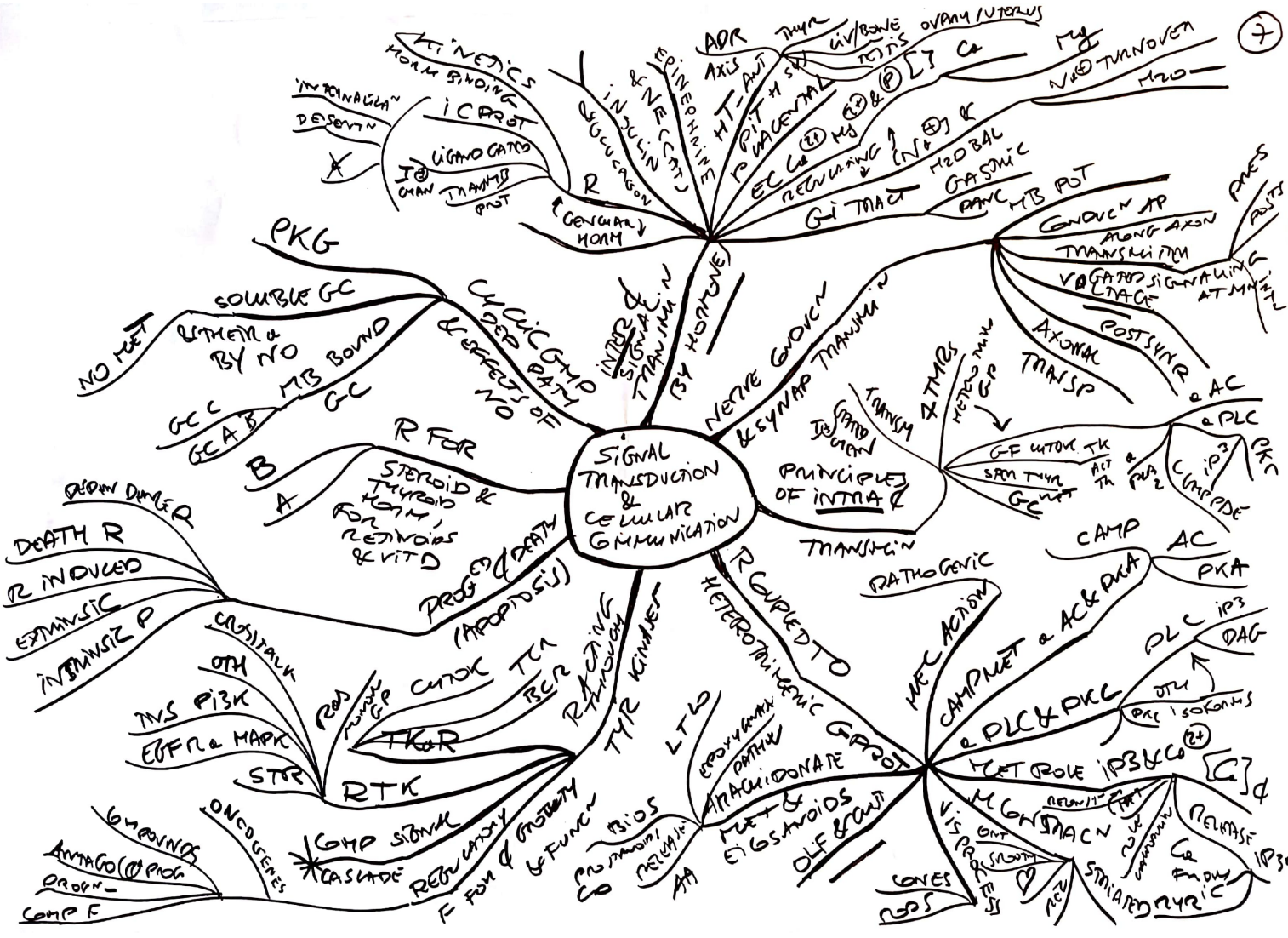

METABOLISM
ETS IN MIT & BAC
ER BASIS OF ± TYPES
ET CHAINS
OPN PRINC
DARK
LIGHT
PHOTOSYNTHESIS
ELECTRON TRANSFER
& OXIDATIVE PHOSPHORYLAN
NITROGEN-CONTAINING
2° METABOLITES
TERPENOIDS
PHENOLICS
PLANT SECONDARY
GLUCOSIS & GLUCONEOGEN
POLY SAC
SHORT CHAIN ALCS
TURN OVER
PYRUVATE
DI & OLIGOSAC
MET HETEROC DERIVATIVES
PENTOSE
AMINOSUGARS
CITRATE CYCLE
GLYOXYLATE
CARB & CITRATE CYC
AA & DERIVATIVES
N FIXAN
GLN
GLU
ASP
ASN
PROLINE
HYDROXY PRO
SER & GLY
AMMONIA
TRANS OFM
LYS THR MET
CYS & CYS
VAL ILE VAL
PHE TYR TRP
HIS
UREA CYC
ARGIN ASSOLYASE
TETRAPYRROLES
PATH FOR BIOS
HEME & CYTOC BIOS
CHLOROPHYLLS
BIOS COBALAMINS
SIROHEME BIOS
LIP & GLYCOLIP
HOPANOIDS
CHOL
PLANT & INVERTS
STEROIDS & ISOPRENOIDS
ISOP
STEROIDS
CORTICOSTER
ANDROG
ESTROG
BA
FA & ACYL-GA
TG
PHOSPHOL
GLYCOL
NUCLEOTIDES & NUCLEOSIDES
PURINES
PYRIMIDINE
COF & VIT
THIAMIN
VIT B1
RETINOL & A
VITA
RIBOFLAVIN
VIT B2 FMN & FAD
PYROXINE
(VIT B6)
COBALAMIN (CONT B12, VIT—)
FOLATES & PTERINES
PANTOTHENATE, CONT A
BIOTIN & ACP
NIGOTINA
NAD+ NADP+
ASCORBATE VITC
VITE CALIFERL VITD
VITK TOCOPHEROL
PHYLOQUINONE
OTHER
BACTERIA
NUC A
EUKARYOTA
NUC A
DNA REPAIR
DNA REPLICAN
DEGRADAN
DNA REPAIR
DNA REPLICAN
SPECIAL BACT & BIOSYNT ANTIBIC
ANTIBIOTICS
QUINONE, ALKANE
UPTAKE OXIDANTS
CHEMIOLITHOTROPHY
ANTIBIOTICS
FERMENTATIONS
MANUP SYST
PROT TRANSP
ACROSS OUTER MB
PROT EXPORT
ACROSS CYTOP MB
ACROSS G⊖
ENV

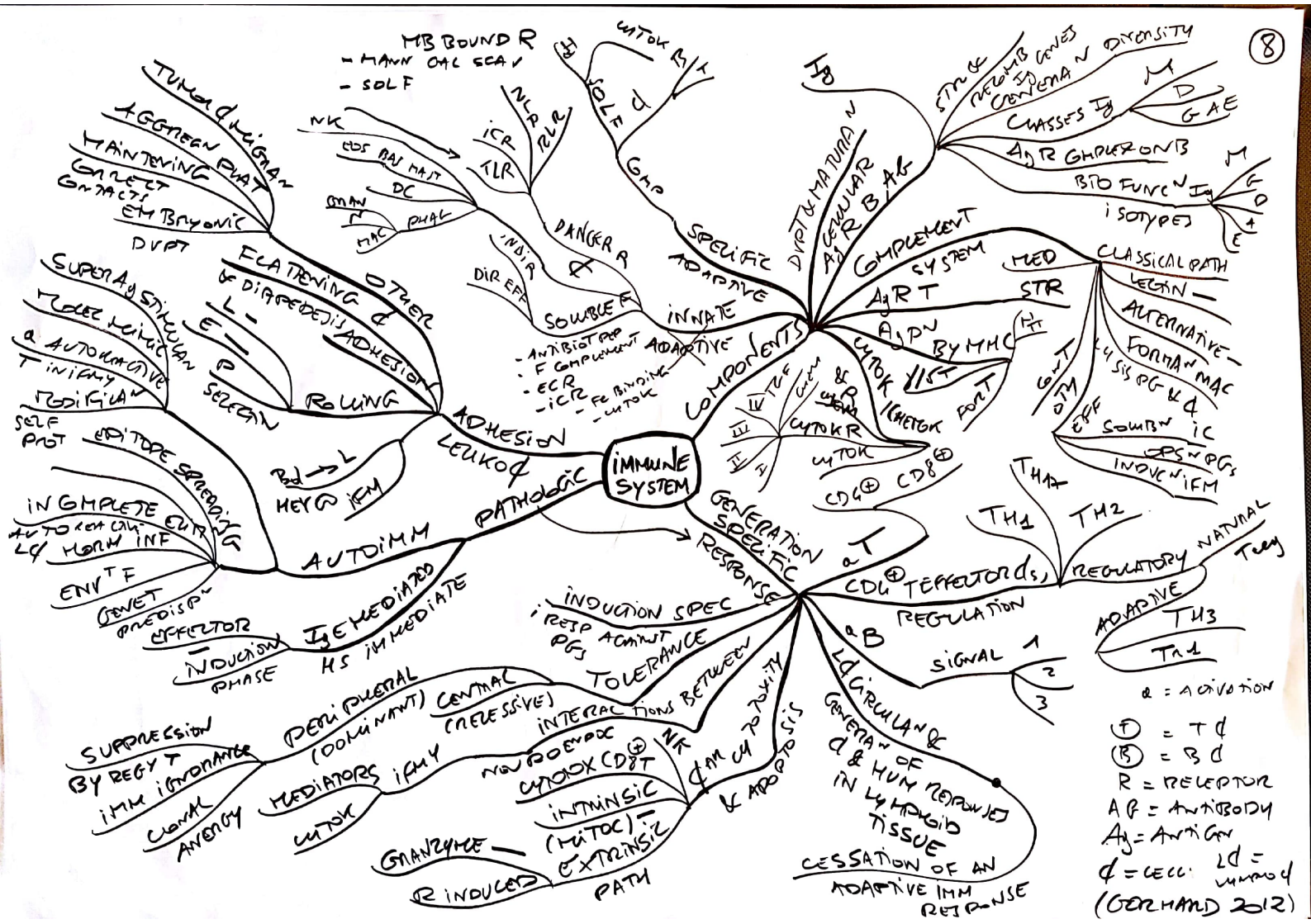

4
PROTEIN BIOSYNTHESIS
MODIFICATIONS
DEGRADATION
BACTERIA
EUKARYA
TRANSCRIPTION
PROTSYNT
DEGRADAN
FOLDING
TRANSPORT
TARGETING
POST TRANSLATIONAL
PROTPROCESSING IN ER
CELL CYCLE IN EUKARYA
CORE COMPONENTS
MACHINERY
REGULAN IN YEAST
CHECK POINTS
G1 -> S TRANSIN
G2 -> M
MITOSIS
MAMMALIAN
REGULAN
TRANSCRIPTION INITIATION
EX
CONTROL
E. coli lac zyA
REPRESSOR
OPERON
STRUCT
RESPONSE
RNA POLS
RNA POL II
ATTENUATION
TRP LOCI
TF
CAPPING
SPLICING
POLY ADENYLATION
RNA POLY
RNA PROC
MODIFICN
DEGRADAN
REGULATIONS
CONS
MRNA
RNA
PROCESSING
CODING FOR PROT MRNA
UNMANIPULATED RNAS
ACCURACY
INHIBITORS
RNA PROCESSING
PROTEINS
PRE INITIAN
RNA POLYMERASE
INITIAN
ELONGAN
PROTEASES
AMINOACYL tRNA TRANSFERASE
TRIB
ATP
ACID NUCLEIC
RNA ENDO
RETINICN ENDO
EXO
DNASES
TRANSCRIPTN
PROTEASOME SYSTEM
UBIQUITIN-PROTEASOME SYSTEM
UPS
PEG BY
CHLOROPLASTS
TOMMO
TM
TM
OUTER-INNER
MITOC
NUCLEUS
TRANSP MEC
TRANSLOCATING MEC
REGULAN MEC
INDEP
NAV DEP
TRANSP MEC
TRANSLOCATING MEC
VESICULAR
TRANSPORT
SEC FOLDING
TRANSPVESIC
PATH
TRANSP
EUK
ER
BACTERIA
EUK CYTOSOL
Bd GROUPS
TERMINAL CARB
STR
GLYCOCONJUGATES
GLYCOSYLAN
SYNT GL
SYNT PG
SYNT GP
ACYLAN PROT
REACN IN GOLGI APP
FORMAN LIP ANCHORED
PROT
SYNT DOLICHOL-BOUND
OLIGOS
LOCAN ON
PROT
N-GLYCOSYLAN
PROT S & IMPORT


VIRUSES
RETRO
HIV
HUMAN IMMUNODEF
TEST &
ANTIVIRAL DEF SYST
REC RT
REPLICAN CYCLE
GENOME STR
HIV 1 & PROT PROCESSING
RNA
HEPATITIS C
LIFE CYCLE
HCV GENOME
DNA
PAPILLOMA
LIFE CYCLE
ENTRY & ESTABLISH IFC
REPLICAN PHASE
VIRION FORMAN
ASSEMBLY & RELEASE
MED ASPECTS
GEN CHAR
GENOMIC
STR
VIRION
VIROIDS
PRIONS

TRANSPORT

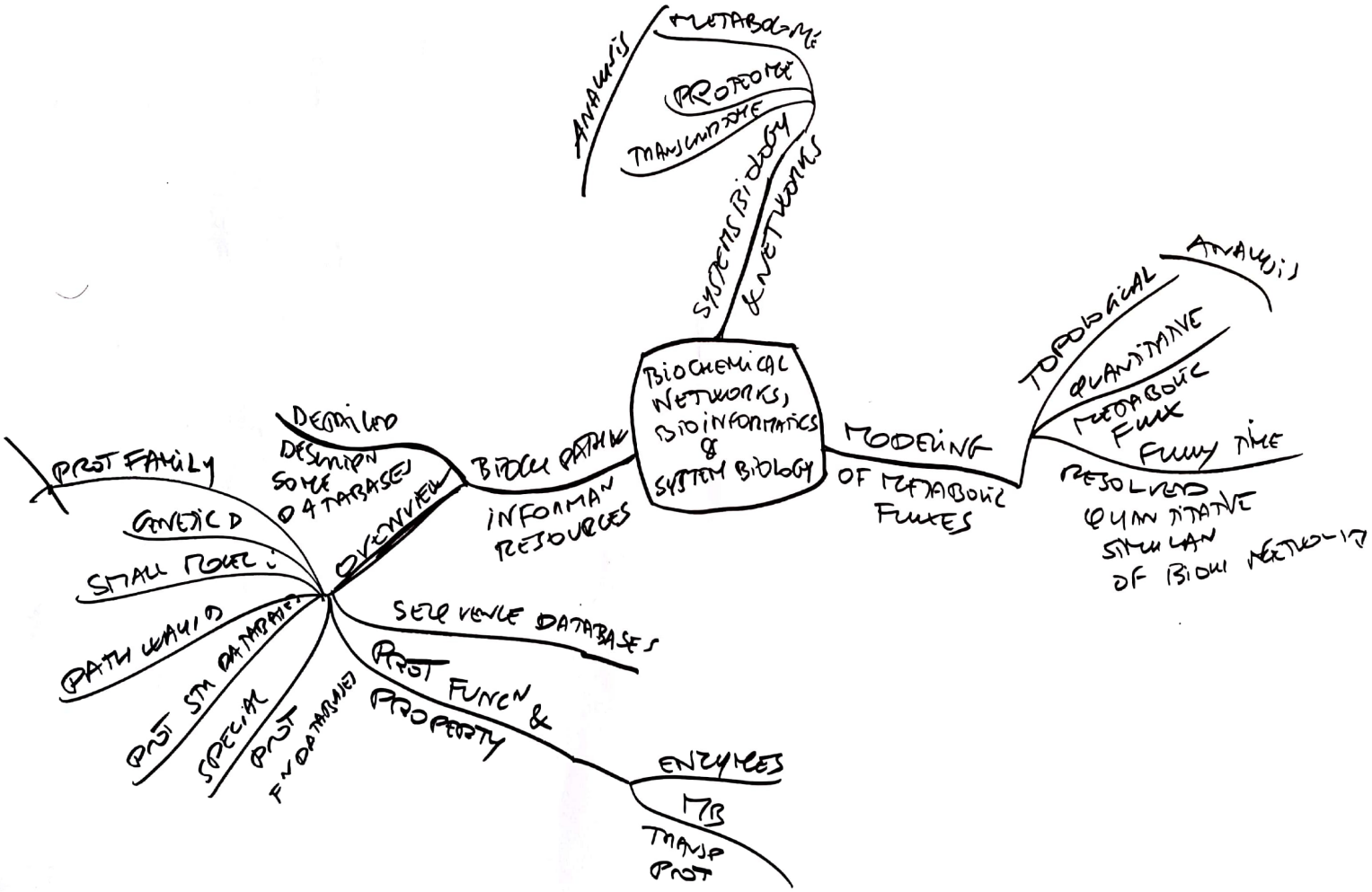
- LIGAND-GATED ION CHAN
  - INVERTEBR GLUTAMATE FAM
  - GABA
  - 5HTR
  - NICOTINIC ACHR
  - P2X R FAM
  - ATP-GATED
  - PYRIMIDINE
  - CYS-LOOP FAM NTR
- VOLTAGE-GATED ION CHANNELS
  - Na^+ & Ca^{2+}
  - K^+
- CHANNELS/PORES
- TC SYSTEM
  - INTGMP
  - ACCESORY & INVOLVED TRANSP
  - GROUP TRANSLOCATION
  - PRIMARY ACTIVE TRANSP
  - ELECTRO CHEM
  - POT DRIVEN
  - CHAN/PORES
  - ECG CAR
- SYST EUK
  - MB PASSAGE THROUGH MB
  - E REQUIREMENTS
- SOLUTE CARRIERS
  - BA: BASS FAM
  - NT: NSS FAM
  - SOLUTE: Na^+ GSS FAM IMPORTANT TE
  - CATION: Cl
    - CCC COTRANSP
    - DICARBOXYLATE: SYMP DAACS
    - CATION Na^+ OR H^+
    - Ca^{2+}/CO^+ ANTIP
    - MITOC MC
    - UDP-GAL
- PRIMARY ACTIVE TRANSP SYST
  - Na^+/K
  - UMP ANTIP
- IMPORT BY ENDOC & PINOC
  - PINOC
  - CLATHRIN
  - GAGED VESICLES
  - UBIQUED
- CYTOSKEL AS MEANS
  - STRC MET
  - MOTION
  - DURING MITOSIS
  - IC MVT ALONG MT
  - ECMVTS
  - ACTINF
  - IF
  - TOPIC TRANSP & CMVTS EUK
- O BY HB
  - DISEASES
  - O BINDING
    - DISSOCIAT CURVES HB OXIGENATION
  - TO BIOS & PROP HB & MB
    - STR
    - GLOBIN BIOS
    - HEME BIOS
    - HB
- LIPIDS IN PLASMA
  - DISORDERS
  - APOLIPOPROT (APO)
  - MET
    - CHYLOMIC MET
    - VLDL/LDL
    - HDL
  - SCAV PATH
  - TRANSP PROT
    - ABCA1
    - LETP
  - LIP R
    - HDL
    - CHYLEMNANT R
    - SCAV R
    - LDL


7
SIGNAL TRANSDUCTION & CELLULAR COMMUNICATION
PRINCIPLES OF INTRA R
NERVE GROWTH & SYNAP TRANSMIN
INTRA & SIGNAL TRANSMIN BY HORMONE
CYCLIC GMP DEP PATH & EFFECTS OF NO
SOLUBLE GC
NO MET
BETWEEN a BY NO
MB BOUND GC
GCC
GCAB
PKG
R FOR
STEROID & THYROID HORM, RETINOIDS & VIT D
DEATH R
R INDUCED
EXTRINSIC
INTRINSIC P
DEATH DOMAIN
PROG (DEATH (APOPTOSIS))
CROSSTALK
OTH
INS PI3K
EGFR a MAPK
STAT
RTK
GMP SIGNAL CASCADE
ONCOGENES
GMPOUNDS
ANTAGO (@ PROG
ORGN
COMP F
REGULATORY F FOR & GROWTH & FUNCTION
TYR KINASES
TKR
CYTOK
TCR
BCR
RECEPTOR TYROSINE
LTD
PROTEOLYSIS
PROTEIN
RELEASE
AA
HETEROTRIMERIC GPCR
R COUPLED TO
EICOSYNOIDS
PATHWAY
ARACHIDONATE
MET & OLF BRANCH
MEC ACTION
CAMP MET a AC & PKA
a PLC & PKC
MET PROTE IP3 & Ca
M GMP
VISPROCESS
STRIATED MYRIC
CONVES
MOS
RELEASE
Ca
IP3R
PATHOGENIC
TRANSMIN
TRANSMIN
ATTACHED
METABOTROPIC GP
GF
SPM THYR
GC
ACT TK
PKA 2
IP3
CAMP
AC
PKA
PLC
IP3
DAG
OTH
PKC
CAMPDE
AXONAL TRANSP
POSTSYNR
a AC
a PLC
PKC
GANGLION AP ALONG AXON TRANSMISSION
VOLTAGE GATED SIGNALING CHANNEL
ATMAN
PRES
POST
ADR
AXIS
THYR
HT-PAT
PITUITARY
ADRENAL
OVARY / UTERUS
TESTIS
BONE
Ca
Mg
NA TURNOVER
H2O
EC Ca
Mg
REGULATING
NA & K
H2O BAL
GASTRIC
GI TRACT
PANC
MB POT
EPINEPHRINE & NEURONS
INSULIN
GLUCAGON
R
GENERAL HORM
KINETICS
HORM BINDING
iCPROT
INTRACELLAR
DESORPTION
LIGAND GATED
Ca
MAN
TRANSMB
PROT
X


IMMUNE SYSTEM
COMPONENTS
ADAPTIVE
INNATE
SPECIFIC
SOLF
GAP
DANGER R
SOLUBLE F
- ANTIBIOTICS
- F COMPLEMENT
- ECR
- ICR
- FC BINDING
- CYTOK
DIR EFF
INDIR
NLR
RLR
ICR
TLR
NK
EOS BAS MAST
DC
MAC
PHAG
MB BOUND R
- MANN OAL SCAV
- SOLF
CYTOK R/T
Ig
DVPT & MATURATION
CELLULAR AgR B Ag
Ig
STRUC
RECOMB GENES
CONVERSION
DIVERSITY
CLASSES Ig
M
D
G A E
AgR GHOMEOSTASIS
BIO FUNC^N
isotypes
M
G
A
E
COMPLEMENT
SYSTEM
AgRT
AgPN
BY MHC
CYTOK
RECEPTOR
PORT
CLASSICAL PATH
LECTIN
ALTERNATIVE
FORMATION
MAC
LYSIS PG & C
IC
OPSN PGs
INDUCN IFM
MED
STR
GUT
OTM
EFF
SOMBN
CYTOK R
CYTOK
CD4⊕
CD8⊕
ADHESION
LEUKOC
PATHOLOGIC
ROLLING
SELECTIN
P
E
L
FLATTENING & DIAPEDESIS
ADHESION
OTHER
TUMOR & INFLAMM
AGGREGATION PHAT
MAINTENING
GAMETE
CONTACTS
EMBRYONIC
DVPT
SUPER Ag STIMULATION
MOLEC MIMICRY
& AUTOIMMUNE
T INFLAMM
MODIFICATION
SELF
PROT
EPITOPE SPREADING
INCOMPLETE
AUTOREACTIVE
LYM
HORM
INF
ENV^T F
GENET
PREDISP^N
AUTOIMM
Ig MEDIATED
HS IMMEDIATE
EFFECTOR
INDUCTION
PHASE
MEY
IFM
GENERATION
SPECIFIC
RESPONSE
αT
CD4⊕ EFFECTOR(s)
REGULATION
REGULATORY
NATURAL
Treg
TH1
TH2
TH17
ADAPTIVE
TH3
Tr1
αB
SIGNAL 1
2
3
INDUCTION SPEC
RESP
PGs
AGAINST
TOLERANCE
INTERACTIONS BETWEEN
PERIPHERAL
(DOMINANT)
CENTRAL
(RECESSIVE)
SUPPRESSION
BY REGY T
IMM IGNORANCE
CLONAL
ANERGY
MEDIATORS
IFMY
CYTOK
NON PROTEOX
CYTOTOX CD8⊕ T
INTRINSIC
(MITOC)
EXTRINSIC
PATH
NK
CAM
CYTOTOXICITY
& APOPTOSIS
GRANZYME
R INDUCED
LYMPHOCIRCULATION
GENERATION OF
& HUM RESPONSES
IN LYMPHOID
TISSUE
CESSATION OF AN
ADAPTIVE IMM
RESPONSE
α = ACTIVATION
(T) = T cell
(B) = B cell
R = RECEPTOR
AB = ANTIBODY
Ag = ANTIGEN
cell = LYMPHOCYTE
(GERHARD 2012)

Blood Coagulation & Fibrinolysis

- Hemostasis
  - Regulation after initiation
    - Following reactions
      - VC compounds
      - Plat
      - Coag
      - Cas
      - Tissue
      - Coag inh
    - Fb inhibitor
    - Inh inhibitor
    - Inhibitor
    - Fibrinolysis inhibitor
    - Coagcasc
- Initiation reactions
  - Initiated by TF
    - Contact
      - Intrinsic
      - Extrinsic
    - BDK
    - Kallik
    - VII
    - TF
  - Binding sites
    - Coagulopl
    - Prot C
    - Cholesterol
    - OTH
    - V/Va
    - COF
    - VIII/VIIIa
    - TF
  - Common binding sites
- Fibrinolysis
  - Pathways of plasminogen a
    - Contact a coagn
    - UPA
    - tPA
  - Cont
- Platelets
  - Cont coagn
  - M part
  - Adhesion of platelet shape
    - Coagulation
    - Vasculary effects
  - ADH
    - Vitronectin
    - Integrin
    - GP
- Coagulation propagation & control
  - Reinforcement for protease activity
    - Binding sites
    - Cofactor activate
  - Path ways leading to thrombin
  - Key events
  - Controlled propagation
  - Generation fibrin


BIOCHEMICAL NETWORKS, BIOINFORMATICS & SYSTEM BIOLOGY
SYSTEMS BIOLOGY & NETWORKS
ANALYSIS
METABOLOME
PROTEOME
TRANSCRIPTOME
MODELING OF METABOLIC FLUXES
TOPOLOGICAL
ANALYSIS
QUANTITATIVE
METABOLIC FLUX
FUZZY TIME
RESOLVED QUANTITATIVE SIMULATION OF BIOCHEM NETWORKS
BIOCHEM PATHWAY
INFORMATION RESOURCES
DETAILED DESCRIPTION SOME DATABASES
OVERVIEW
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GENETIC D
SMALL MOLEC
PATHWAYS
PROT STR DATABASE
SPECIAL PROT FUNCTIONAL DATABASE
SEQUENCE DATABASES
PROT FUNCN & PROPERTY
ENZYMES
MB
TRANSP PROT