References 1

Links: Abstracts, Articles, etc.

These links should work as of 2014; sometimes you have to click on them several times; if they don’t work, then Google/search the titles

Iodine and: soy, NIS, antibodies, TH production, ocular, salivary, P450


http://jp.physoc.org/content/590/23/6013.long Dietary iodide controls its own absorption through post-transcriptional regulation of the intestinal Na+/I− symporter.


http://www.optimox.com/pics/Iodine/IOD-05/IOD_05.html Pro-Iodine advocate Abraham


http://www.revophth.com/content/d/therapeutic_topics/i/1216/c/22903/ Iodine and ophthalmology.


http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2654752/ NIS and Pendrin Iodine homeostasis.
http://biolargo.com/industry-news/iodine-the-next-vitamin-d-part-ii/ Iodine as vitamin?

http://www.ncbi.nlm.nih.gov/pubmed/9111521 Iodine metabolism and thyroid-related functions in organisms lacking thyroid follicles: are thyroid hormones also vitamins?


http://curezone.org/forums/am.asp?i=1930716 Iodine swelling salivary glands; forum discussion


http://www.ncbi.nlm.nih.gov/pubmed/24480283 Potential method to measure iodine levels in tendon biopsies?--since scintigraphy won’t work due to poor blood supply; need to ask about method to measure total iodine or NIS expression in tendons


http://iodine.atomistry.com/pdb1s6v.html Iodine in the structure of Structure of A Cytochrome C Peroxidase-Cytochrome C Site Specific Cross-Link (pdb 1s6v)

http://www.oarsijournal.com/article/S1063-4584(07)00117-3/abstract Effects of selenium and iodine deficiency on bone, cartilage growth plate and chondrocyte differentiation in two generations of rats. The purpose of the current study was to investigate the roles of combined selenium and iodine deficiency in bone development as a possible experimental model of Kashin-Beck osteoarthropathy.


References 1 website: JMR, http://fluoroquinolonethyroid.com
Discovery of Aryltrifluoroborates as Potent Sodium/Iodide Symporter (NIS) Inhibitors

How Can I Safely Consume Seaweed

Influence of substituents in fluorobenzene derivatives on the cytochrome P450-catalyzed hydroxylation at the adjacent ortho aromatic carbon center.

Chronic Illness:

Five tough choices you face when chronically ill or in pain

What Should We Say? Research article

Thyroid (genomic and nongenomic), Deiodinases, selenoproteins, estrogens/steroids, SJS, SCL families, Fluorine, ACh-related, tyrosine-related, mitochondrial, topoisomerases:

Thyroid Hormone Synthesis and Secretion

Thyroid hormone action on intermediary metabolism (T3 directly stimulates mitochondrial respiration and ATP synthesis)

Thyroid: biological actions of 'nonclassical' thyroid hormones.

Overlapping nongenomic and genomic actions of thyroid hormone and steroids.

Membrane receptor for thyroid hormone: physiologic and pharmacologic implications.
Nongenomic Actions of Thyroid Hormone

Thyrotropin-Blocking Autoantibodies and Thyroid-Stimulating Autoantibodies: Potential Mechanisms Involved in the Pendulum Swinging from Hypothyroidism to Hyperthyroidism or Vice Versa

Nongenomic signaling pathways triggered by thyroid hormones and their metabolite 3-iodothyronamine on the cardiovascular system.

Bioactivity of thyroid hormones. Clinical significance of membrane transporters, deiodinases and nuclear receptors.

Drug-induced thyroid dysfunction

Structure and function of the type 3 deiodinase gene.

Selenium and the thyroid gland: more good news for clinicians.

Selenium, selenoproteins and the thyroid gland: interactions in health and disease.

Selenium and endocrine systems.

SELENBP1 (Selenium Binding Protein)

The role of selenium in endocrine system diseases.

A specific multi-nutrient formulation enhances M1 muscarinic acetylcholine receptor responses in vitro.

The effect of dietary selenium on lead neurotoxicity.

Thyroid hormones and skeletal muscle--new insights and potential implications. Di’s and skeletal muscle, local control T3

The role of the iodothyronine deiodinases in the physiology and pathophysiology of thyroid hormone action.

Thyroid hormone deiodinases--a selenoenzyme family acting as gate keepers to thyroid hormone action.

Dissertation: Effect of Estrogen Status on Selenium Metabolism in Female Rats
Selenoprotein W expression and regulation in mouse brain and neurons.

Regulation and function of selenoproteins in human disease.

Statin-induced liver injury involves cross-talk between cholesterol and selenoprotein biosynthetic pathways.

New compound may act to keep thyroid activity in check, OHSU study finds T1 amine rapidly causes hypothermia, blood pressure drop, slow pulse

Paul Robinson, C3TM (using T3 only)

Lauren Trepanier, DVM: Serum total thyroxine, total triiodothyronine, free thyroxine, and thyrotropin concentrations in epileptic dogs treated with anticonvulsants. This type of study would be easy enough to replicate using FQ’s vs AITD panels relatively inexpensively (10 grand or less)

Lauren Trepanier, DVM: Clinical hypothyroidism associated with trimethoprim-sulfadiazine administration in a dog.

Comparison of the mechanisms of nongenomic actions of thyroid hormone and steroid hormones.

Does thyroid peroxidase provide an antigenic link between thyroid autoimmunity and breast cancer? Note possible antigenic epitopes in common

Mechanisms of action and cross-talk between estrogen receptor and progesterone receptor pathways.

Full paper, Tomer: Genetic Susceptibility to Autoimmune Thyroid Disease: Past, Present, and Future

Partial iodide organification defect caused by a novel mutation of the thyroid peroxidase gene in three siblings.

TPO Info

Neuroendocrine manifestations in Sjögren's syndrome.

Adrenal and gonadal steroid hormone deficiency in the pathogenesis of rheumatoid arthritis.


http://www.ncbi.nlm.nih.gov/pubmed/23978482  Associations between single nucleotide polymorphisms in thyroid hormone transporter genes (MCT8, MCT10 and OATP1C1) and circulating thyroid hormones.


https://sites.google.com/site/annerwright/cholinesterase-inhibitors  Anne Wright, cholinesterase inhibitors as a source of chronic illness.

http://www.jbc.org/content/281/15/10347.full  Acetylcholinesterase Dynamics at the Neuromuscular Junction of Live Animals

http://www.ncbi.nlm.nih.gov/pubmed/22981737  Specific binding of collagen Q to the neuromuscular junction is exploited to cure congenital myasthenia and to explore bases of myasthenia gravis.


http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3683220/  Ocular Myasthenia Gravis in a setting of thyrotoxicosis. Note similarity to acute phase of FQT (both TH and ACh(e) affected).

https://sites.google.com/a/macalester.edu/nerve-agents/home/acetylcholine-and-vx  Nerve agents. Nice descriptions of ACh and AChE mechanisms

http://www.cjpt.ac.cn/EN/abstract/abstract1056.shtml  Effect of herbicide sulcotrione on serum tyrosine level in rats


http://en.wikipedia.org/wiki/Choline  Choline info
Modulation of mood and cognitive performance following acute administration of single doses of Melissa officinalis (Lemon balm) with human CNS nicotinic and muscarinic receptor-binding properties.

Muscarninic and Nicotinic Acetylcholine Receptor Agonists and Allosteric Modulators for the Treatment of Schizophrenia. Excellent review

Thyroid function in patients with Alzheimer disease: implications on response to anticholinesterase treatment

Magnesium effect on the acetylcholinesterase inhibition mechanism: a molecular chromatographic approach.

Copper, aluminum, iron and calcium inhibit human acetylcholinesterase in vitro.

Extensive expression of markers for acetylcholine synthesis and of M2 receptors in tenocytes in therapy-resistant chronic painful patellar tendon tendinosis - a pilot study.

Presence of a non-neuronal cholinergic system and occurrence of up- and down-regulation in expression of M2 muscarinic acetylcholine receptors: new aspects of importance regarding Achilles tendon tendinosis (tendinopathy).

Studies on the importance of sympathetic innervation, adrenergic receptors, and a possible local catecholamine production in the development of patellar tendinopathy (tendinosis) in man.

Immunohistochemical and in situ hybridization observations favor a local catecholamine production in the human Achilles tendon.

VGluT2 expression in painful Achilles and patellar tendinosis: evidence of local glutamate release by tenocytes.

Acetylcholine beyond neurons: the non-neuronal ACh system in humans

Activation of muscarinic receptors by non-neuronal acetylcholine.

Release of non-neuronal acetylcholine from the isolated human placenta is affected by antidepressants. Note: “Theophylline may also interfere with the release of non-neuronal ACh”.

References 1

The non-neuronal cholinergic system in humans: expression, function and pathophysiology.

What drugs should be avoided in myasthenia gravis? Note both FQ’s and Pred are on the list

Drugs Which May Exacerbate or Induce Myasthenia Gravis: A Clinician’s Guide

Pseudocholinesterase deficiency

Breakage of tolerance to hidden cytoplasmic epitopes of the acetylcholine receptor in experimental autoimmune myasthenia gravis

Thyroid status and muscarinic receptor density and affinity in rat intestinal smooth muscle

Effect of thyroid status on beta-adrenoreceptors and muscarinic receptors in the rat lung.

Ganglionic Autonomic Neuropathy ACh Woolygimp’s story

Muscle Specific Receptor Tyrosine Kinase Antibody Positive Myasthenia Gravis Current Status

Interaction between ciprofloxacin and melanin: the effect on proliferation and melanization in melanocytes. “Ciprofloxacin reduces melanin content, and decreases tyrosinase activity in human skin melanocytes” ejuszman@kum.edu.pl

Melanin potentiates gentamicin-induced inhibition of collagen biosynthesis in human skin fibroblasts. “In view of the fact that a number of pharmacologic agents are known to form complexes with melanin and melanin is an abundant constituent of the inner ear tissues, we determined whether gentamicin interacts with melanin and how this process affects the biosynthesis of collagen in cultured human skin fibroblasts”. – consider FQ’s affect tyrosinase → melanin in inner ear → tinnitus

Dopamine, in the presence of tyrosinase, covalently modifies and inactivates tyrosine hydroxylase.

Tyrosine hydroxylase is inactivated by catechol-quinones and converted to a redox-cycling quinoprotein: possible relevance to Parkinson’s disease.

The Role of Dopamine Quinone Formation and Tyrosinase in a Model of Parkinson’s Disease


http://www.nature.com/nm/journal/v17/n4/full/nm.2307.html  Metabolite profiles and the risk of developing diabetes. “Five branched-chain and aromatic amino acids had highly significant associations with future diabetes: isoleucine, leucine, valine, tyrosine and phenylalanine. A combination of three amino acids predicted future diabetes (with a more than fivefold higher risk for individuals in top quartile). The results were replicated in an independent, prospective cohort. These findings underscore the potential key role of amino acid metabolism early in the pathogenesis of diabetes and suggest that amino acid profiles could aid in diabetes risk assessment”. (Note BCAA and Aromatic abnormalities, which is what I think I got after being floxed)


http://en.wikipedia.org/wiki/Tyrosine_kinase  Tyrosine Kinase info

http://en.wikipedia.org/wiki/Protein_tyrosine_phosphatase  Tyrosine phosphatase info

http://en.wikipedia.org/wiki/Receptor_tyrosine_kinase  Receptor Tyrosine kinases

Tyrosine kinase inhibitor-induced hypothyroidism: incidence, etiology, and management.

Hypothyroidism related to tyrosine kinase inhibitors: an emerging toxic effect of targeted therapy.

A novel tyrosine-kinase selective inhibitor, sunitinib, induces transient hypothyroidism by blocking iodine uptake.

Pharmacokinetics of sunitinib in combination with fluoroquinolones in rabbit model. “Ciprofloxacin is a well-known inhibitor of cytochrome P450 CYP3A4 and causes numerous drug interactions . . . CYP3A4 is involved in the metabolism of the new oral multikinase inhibitor sunitinib.” “Because of the frequent use of FQs for the treatment of bacterial infections, especially UTIs, there is high probability that this group of drugs may be associated with patients on sunitinib”.

Full paper: Tyrosine Kinase Inhibitors Induced Thyroid Dysfunction: A Review of Its Incidence, Pathophysiology, Clinical Relevance, and Treatment

Tag Archives: receptor tyrosine kinases

Receptor tyrosine kinases

Three-dimensional structure of the free radical protein of ribonucleotide reductase. The enzyme ribonucleotide reductase furnishes precursors for the DNA synthesis of all living cells. One of its constituents, the free radical protein, has an unusual alpha-helical structure. There are two iron centres that are about 25 Å apart in the dimeric molecule. Tyrosine 122, which harbours the stable free radical necessary for the activity of ribonucleotide reductase, is buried inside the protein and is located 5 Å from the closest iron atom.

The tyrosyl free radical in ribonucleotide reductase. Note: as above, this tyrosyl radical is located at Tyrosine 122, may not be significant due to numbering scheme however

Using Tyrosine to monitor steroid Tx – interesting

Blood content of tyrosine is an index of glucocorticoid action on metabolism.
The Serum Tyrosine Level as an Index of Thyroid Function – Note Vite C connection

Diurnal variation of phenylalanine and tyrosine concentrations in adult patients with phenylketonuria: subcutaneous microdialysis is no adequate tool for the determination of amino acid concentrations

Spontaneous Achilles tendon rupture in alkaptonuria

Fibronectin in collagen

Fibronectin and laminin in Achilles tendon.


Tendon synovial cells secrete fibronectin in vivo and in vitro.

Multiple Tyrosine Metabolites are GPR35 Agonists

The protein tyrosine kinase family of the human genome

Tyrosine Hydroxylase Deficiency

Functional Properties and Genomics of Glucose Transporters (look for tyrosines in conserved sequences)

SLC5 family of sodium-dependent glucose transporters: Nice descriptions, note iodide, choline, B vites uptake, as well as lactic acid and nicotinic receptor connections

SLC5A5 (solute carrier family 5 (sodium iodide symporter), member 5). Excellent reference on SLC5A

Presence and influence of cholinergic nerves in the human thyroid.

Presence and influence of cholinergic nerves in the mouse thyroid.
Acetylcholine and norepinephrine: compared actions on thyroid metabolism. (ACh stimulates iodide organification.)

Cholinergic nerves in the thyroid gland.

Antimalarials inhibit human erythrocyte membrane acetylcholinesterase.

Muscarinic cholinergic receptors on cultured thyroid cells. I. Biological effect of carbachol and characterization of the receptors.

Increased Prevalence of Abnormal Lacrimal Gland Function Tests in Patients with Hashimoto’s Thyroiditis: A Cross Sectional Study.

EC 1.11.1.8 - iodide peroxidase

Estrogen effects on thyroid iodide uptake and thyroperoxidase activity in normal and ovariectomized rats.

Thyroid peroxidase

Tyrosine phosphorylation sites and antibodies specific for them.

Topoisomerase

DNA TOPOISOMERASES: Structure, Function, and Mechanism

Topoisomerase 1 and 2. Good description on YouTube of topo’s.

Characterization of human DNA topoisomerase II as an autoantigen recognized by patients with IDDM. Look for anti-TOPOII’s in FQ victims, and look for homologous epitopes in TH/Iodine metabolism. See full length other paper for discussion of TOPOII’s and GAD-65 for Type I DM. Remember, FQ’s affect glucose metabolism as well.

Receptor tyrosine kinases are signaling intermediates of G protein-coupled receptors.

Thyroid hormones modulate both adenosine transport and adenosine A1 receptors in rat brain.

Caffeine and theophylline as adenosine receptor antagonists in humans.
Adenosine receptor activation and the regulation of tyrosine hydroxylase activity in PC12 and PC18 cells.

Structural features of adenosine receptors: From crystal to function

Thyrotropin regulates adenosine A1 receptor expression in rat thyroid FRTL-5 cells

New Approaches to Thyroid Hormones and Purinergic Signaling

Thyroid status and adenosine content of adipose tissue

Alpha-2 adrenergic stimulation triggers Achilles tenocyte hypercellularity: Comparison between two model systems. "tyrosine hydroxylase is expressed in tenocytes"

FQ’s

Determination of the Excitatory Potencies of FQs in the CNS by an in vitro model: “Considering the Mg++ chelating properties of fluoroquinolones, which have been also postulated as a mechanism for fluoroquinolone action in juvenile cartilage (7, 24, 35), it is tempting to speculate that the excitatory potency of fluoroquinolones might be based on activation of the NMDA receptor by abolishing the Mg21 block in the ion channel.”

Cipro and T Lymphocytes

Cipro is genotoxic – good paper despite poor translation, as it’s one of the first I’ve seen to mention the “syndrome” of effects somewhat and has a warning tone about topo’s being affected with widespread results

James Roberts MD “Adverse Reactions to FQ’s, Part 1” link for doctors

James Roberts MD “Adverse Reactions to FQ’s, Part 2” link for doctors
The mitochondria targeted antioxidant MitoQ protects against fluoroquinolone-induced oxidative stress and mitochondrial membrane damage in human Achilles tendon cells.

Daniel J Smart, studies “safety” of genotox of FQ’s for pharma, note email address

Amino acids in oral drug delivery: salts, ion-pairs and transcriptomics. Note: Cipro used as zwitterion

Analysis of the Membrane Proteome of Ciprofloxacin-Resistant Macrophages by Stable Isotope Labeling with Amino Acids in Cell Culture (SILAC)

Ciprofloxacin MG warning

Structure-activity and structure-side-effect relationships for the quinolone antibacterials

Quinolone-DNA Interaction: Sequence-Dependent Binding to Single-Stranded DNA Reflects the Interaction within the Gyrase-DNA Complex

Crystal structure of the breakage–reunion domain of DNA gyrase. “The gyrase structure reveals a new dimer contact with a grooved concave surface for binding the G segment and a cluster of conserved charged residues surrounding the active-site tyrosines.”

Interactions of a Series of Fluoroquinolone Antibacterial Drugs with the Human Cardiac K+ Channel HERG

Quinolone generations: natural history or natural selection?

Pharmacokinetic-Pharmacodynamic Contributions to the Convulsant Activity of Fluoroquinolones in Rats

Structure and Function of DNA Gyrase

Molecular Aspects of DNA Gyrase (same site as above)

Combatting Antibacterial Drug Resistance. Nice descriptions of FQ mechanisms and topos

Iron supplements: a common cause of drug interactions. Consider low iron → increased effective
concentration and toxicity in people with low iron. Note FQ’s bind with divalent and trivalent cations, FQ’s may bind with heme groups in TPO, other?

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC172774/ Effect of ferrous sulfate and multivitamins with zinc on absorption of Ciprofloxacin in normal volunteers

http://www.ph.ucla.edu/epi/bioter/ciprodownside.html Downside of Widespread Cipro Use

http://hearinglosshelp.com/weblog/is-ciprofloxacin-cipro-ototoxic.php Is Ciprofloxacin (Cipro) Ototoxic?

http://www.medical-hypotheses.com/article/S0306-9877(14)00217-5/fulltext Fluoroquinolone antibiotics and type 2 diabetes mellitus


https://www.youtube.com/watch?v=kUd2hAYfM2s Dr. Najeeb’s FQ lectures

http://en.wikipedia.org/wiki/SLC22A8 Cipro Transporter. SLC22A8, Solute carrier family 22 member 8 is a protein that in humans is encoded by the SLC22A8 gene, also called organic anion transporter 3 (OAT3).

http://en.wikipedia.org/wiki/Organic_cation_transport_proteins An organic cation transport protein mediates the transport of organic cations across the cell membrane. Not sure if it transports FQ’s; consider possibility in zwitterionic form

http://www.ncbi.nlm.nih.gov/pubmed/2771865 Neurochemical studies on quinolone antibiotics: effects on glutamate, GABA and adenosine systems in mammalian CNS.

http://www.theecologist.org/News/news_analysis/897407/popular_antibiotic_ciprofloxacin_linked_to_uk_deaths.html Popular Antibiotic Cipro linked to UK deaths


References 1 website: JMR, http://fluoroquinolonethyroid.com
Other:

http://www.bioparadigms.org/slctable.asp Scientific resource for membrane proteins

http://www.chdct2.org/ Coalition for Heritable Disorders of Connective Tissue

http://www.ncbi.nlm.nih.gov/pubmed/24628082 Endocrine disruptome--an open source prediction tool for assessing endocrine disruption potential through nuclear receptor binding. Provides database website info, and can get emails of authors too with a little searching.


http://www.hhmi.org/biointeractive/genetic-switches Learn about genetic switches on/off

http://www.ncbi.nlm.nih.gov/books/NBK1335/?report=printable Marfan’s Syndrome info


http://www.drugbank.ca/drugs/DB00279/biointeractions#transporter-tab Drug Bank: Interactions with T3


http://www.tcdb.org/search/result.php?tc=2.A.60.1 Transporter Classification Database

http://www.tcdb.org/search/result.php?tc=2.A.60#ref4998 Transporter Classification Database, references, includes papers with both TH and FQ’s

http://www.biograf.ch/data/projects/virtualtoxlab_results.php#3 Virtual Tox Lab --The VirtualToxLab is an in silico tool for predicting the toxic potential (endocrine and metabolic disruption, some aspects of carcinogenicity and cardiotoxicity) of drugs, chemicals and natural products

https://www.youtube.com/watch?v=A2OS1kv5kgU Epigenetic Genome Control Lecture

https://www.youtube.com/watch?v=5ZE7o_bRekk Craig Mello Google Talk on RNAi, Gene Expression, Evolution

https://www.youtube.com/watch?v=j-WVNeyh6do Micro RNA’s and other small regulatory RNA’s

http://vimeo.com/32792885 Autoimmune Autonomic Failure: Treatable, Under-diagnosed. Steve Vernino, PhD.
http://en.wikipedia.org/wiki/Type_I_topoisomerase  Type I topoisomerase

http://publications.nigms.nih.gov/insidelifescience/genetics-numbers.html  Genetics by the numbers: interesting soundbite facts about DNA and genetics


http://www.nature.com/nrd/journal/v12/n8/fig_tab/nrd4052_F1.html  How allostery ligands influence orthosteric ligand function. Good description

https://www.youtube.com/watch?v=T0qFSN0bF7A  Receptors Made Simple:: Adrenergic, Cholinergic, and G Protein Basics. Nice video on YouTube.


https://www.youtube.com/watch?v=WRffHcy6fpE&list=PLYYPVqWiyMhNcb8GQUO-Lfw-NKfNj0KE&index=11  Catecholamine Synthesis and Tyrosine Metabolism. Video on YouTube


http://en.wikipedia.org/wiki/Metalloprotein  Metalloprotein. Metalloenzymes all have one feature in common, namely that the metal ion is bound to the protein with one labile coordination site. As with all enzymes, the shape of the active site is crucial. The metal ion is usually located in a pocket whose shape fits the substrate.

http://www.ebi.ac.uk/pdbe/quips?story=AChE  Acetylcholinesterase: A gorge-ous enzyme

https://www.youtube.com/watch?v=ObrsQI-vPA4  Receptor Tyrosine Kinase

https://www.youtube.com/watch?v=BFjkjINRLh8  Cell Signaling Basics

http://www.rndsystems.com/ihc_detail_objectname_antibody_selection_optimization.aspx  Primary Antibody Selection & Optimization

http://www.ncbi.nlm.nih.gov/pubmed/20235827  Enzyme promiscuity: a mechanistic and evolutionary perspective. (Consider FQ’s as unintentional substrate analogs in enzymes with similar active site sequences and/or conformations)


http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2375356/  How to calculate the dose of chemotherapy. “Typically there is a 4 – 10-fold variation in cytotoxic drug clearance between individuals due to differing
Activity of drug elimination processes related to genetic and environmental factors. For example, the activity of cytochrome P450 (CYP) 3A4/5, the major oxidising enzymes for many cytotoxic drugs varies by as much as 50-fold. A common single-nucleotide polymorphism (SNP) or CYP3A5 has recently been identified and others are being searched for. In addition many drugs and disease states are known to inhibit or induce CYP activity further adding to this variation.

http://www.hormonesmatter.com/molecular-mimicry-autoimmune-disease/ Molecular Mimicry and Autoimmune Disease

http://en.wikipedia.org/wiki/Protein_domain Protein domain

http://en.wikipedia.org/wiki/Phosphotyrosine-binding_domain Phosphotyrosine-binding domain

http://www.biomedcentral.com/1471-2172/7/7#B1 CED: a conformational epitope database


http://www.google.com/search?q=polyclonal+vs+monoclonal+antibody&nord=1&tbn=isch&tbo=u&source=univ&sa=X&ei=psrjU9_DlejA8QH374DgAw&ved=0CDYQsAQ&biw=911&bih=449 Polyclonal vs Monoclonal Antibodies


http://www.ncbi.nlm.nih.gov/pubmed/19358864 Mechanisms involved in the antinociception caused by ethanolic extract obtained from the leaves of Melissa officinalis (lemon balm) in mice.


http://www.ncbi.nlm.nih.gov/pubmed/12888775 Modulation of mood and cognitive performance following acute administration of single doses of Melissa officinalis (Lemon balm) with human CNS nicotinic and muscarinic receptor-binding properties.

http://www.sdsc.edu/pb/pages/projects.php Bourne Lab: What happens when we really take a drug? And other questions answered

http://www.veganhealth.org/articles/choline Nice info on choline

http://www.pdf.org/parkinson_prescription_meds Parkinson's Meds

http://www.protocol-online.org/forums/forum/3-immunology/ Immunology Forums

http://www.progenosis.com/contact Epitope company for questions

http://www.dnastar.com/t-about-contact.aspx DNAstar for questions
Epitope Mapping: Nice tutorial

Antibodies against membrane protein targets: Nice tutorial

Antibody strategies membrane protein targets: Nice tutorial

Haptens

Hapten video

Molecular Mimicry

Why it’s hell to be a doctor in America today

Why Doctors Are Sick of Their Profession

FQ article

Is acetylcholinesterase a Mg-dependent enzyme?

Epithelia Tissue Info

Neuromuscular-blocking drugs block neuromuscular transmission at the neuromuscular junction. This is accomplished either by acting presynaptically via the inhibition of acetylcholine (ACh) synthesis or release or by acting postsynaptically at the acetylcholine receptors of the motor nerve end-plate.

Copper proteins (tyrosinase being one of them)

New technique accelerates genome editing process (CRISPR)

Active Sites

Enzyme Inhibitors (Activators)

False-positive seroreactivity to Borrelia burgdorferi in a patient with thyroiditis

CD98 forms LAT1 transporter for BCAA’s

References 1
http://www.uniprot.org/uniprot/Q01650  Large neutral amino acids transporter small subunit 1, SLC7A5

http://en.wikipedia.org/wiki/Melanin  Melanin (starts with tyrosine)