Chapter 1 : Franklin D. Roosevelt - Wikipedia

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This technique has promise for creating nano-structured meta-materials with unusual optical properties. The device will utilize a thermal beam of atoms for simplicity and high signals. The atom waves will be split and recombined using a single-photon transition at a wavelength of nm. A unique alignment scheme will be used to reduce systematic drifts due to Doppler shifts. We are currently working to improve the linewidth of the nm laser and constructing a nm blue laser to transversely cool the atoms and to detect the output of the interferometer. We are also characterizing a thermal Ca beam using laser absorption and working on precise control of the temperature and flux of the beam. We are also evaluating a precision method to align the thermal beam relative to gravity using Fraunhofer diffraction. Controlled entanglement of two atoms in movable traps Haian Wang, Peng Zhang, Michael Chapman, Li You We propose a scheme for controlled entanglement of two separately trapped atoms. In our setup, the two atoms become entangled after the two initially separated traps are translated towards each other, overlap, and moved apart adiabatically. Cumulative adiabatic phase shifts arising from atomic interactions during the protocol give rise to a final two-atom state that can be conveniently expressed in terms of separable states involving single atoms in well defined traps. We provide a thorough investigation of the efficiencies and effectiveness of our scheme. We further calibrate the dependence of the fidelities of the entangled states on the various control parameters such as the speed of the trap translation. Finally, we show that our setup possesses several advantages and can be easily employed to accomplish a nontrivial quantum gate. Constructing atom optical elements from periodic potentials of finite length Michael W. Esry The manipulation of the dispersion properties of a Bose-Einstein condensate BEC with moving optical lattices has enabled considerable control of atomic matter waves and, more recently, the generation of bright matter wave solitons [1]. It is seen that to vary the effective mass requires potentials that are relatively strong compared to the transverse waveguide confinement. The role of both the linear and non-linear wave mechanics in practical issues such as loading the atoms into the potentials are explored. We also report on work in progress examining matter waves propagation through a chip-based magnetic lattice [2]. Beamsplitting of a Bose-Einstein Condensate in a Microtrap by a Standing Light Wave Quentin Diot, Stephen Segal, Dana Anderson, Eric Cornell We have developed an in-guide atom beamsplitter and demonstrated the coherent nature of the process by observing interference between the split wavepackets. Atoms are then evaporatively cooled to form a Bose-Einstein condensate. Finally, we are able to split the condensate, propagate two wavepackets in opposite directions along the waveguide and read their relative phase by exposing the trapped BEC to a sequence of standing light pulses. We carefully aligned the standing light field with the waveguide by directly mounting mirrors on the chip substrate. Pre-cooled atoms reach the trapping region by following the guide through a um-height tunnel under one of the mirrors. We control the phase shift between the two wavepackets by applying an external magnetic gradient parallel to the guide. After recombining the clouds, we observed coherence signals for up to 10 ms of propagation time. The in-guide production of a condensate, the numerous wires and features available on the chip and the proven coherence of the beamsplitter, make this device a useful tool for understanding and improving the propagation of coherent atomic samples in waveguides. Guiding atoms in a hollow-core photonic bandgap fiber Tetsu Takekoshi, Randy Knize We discuss the current progress of our experiment to guide rubidium atoms in hollow-core photonic bandgap fiber. The atoms are contained within the hollow region of the fiber by the dipole potential created with a strong red-detuned laser. This technique has several significant advantages over other atom guiding experiments using hollow core fiber. As a result, the optical potential is uniform over the length of the fiber. Also, the light field is almost exclusively inside the hollow core, and it is relatively easy to couple light

into the fiber. Since the field inside the fiber can be relatively high, it is possible to detune the laser far from resonance while maintaining a strong dipole potential, and thereby greatly reduce the scattering rate. Applications of cold, magnetically-guided atomic beams S. Raithel In parallel with work aimed at developing a continuous-wave atom laser in a high-gradient magnetic guide, we are exploring tools suited to manipulate cold atomic beams in atom guides. We present an experimental demonstration of using RF-filtering to decrease the number of modes occupied by an atomic flow propagating in a high-gradient atom guide. Through sufficient filtering of this type, a near-single-mode guided atomic beam should be achievable, allowing basic atom-interferometric experiments. We present a new inline beam-splitting scheme using RF-dressed-state potentials. It is shown how this scheme could be employed to build fairly simple large-area Sagnac atom interferometers. Finally, we will present Monte Carlo collision simulations of novel evaporative cooling techniques in a guided atomic beam. Donut modes and photonic hollow fibers: This ability makes these fibers attractive as possible tool for atom optics. One example would be to transport neutral atoms through harsh environments. This would be possible by co-propagating a blue-detuned donut mode with the atoms through the fiber. In this poster we will describe the results and discuss the prospects for atom loading and other applications. Quantum accelerator modes are produced by the diffraction of atomic De Broglie waves. When a standing light wave which acts as a thin phase grating is produced, a group of atoms that have certain initial velocity gets accelerated. The momentum gained by these atoms scales linearly with the number of kicks. Gravity plays an important role in QAM through the phase evolution of the De Broglie wave between any two kicks. QAM can be used in the study of quantum chaos and atom optics. Loading and Manipulating Atoms on a Chip. David Aveline, Robert Thompson, Nathan Lundblad, Lute Maleki We describe a method of efficiently loading and manipulating neutral atoms in atom chip traps. Cooled 87Rb from a MOT is transported via coil-based magnetic traps into chip-based wire traps and precisely directed in wire-guides. At this distance, a conventional MOT of six beams can be made without obstruction from the chip and its mounting structure. Trading currents between the two coils smoothly translates a magnetic trap over to the chip region. Finally, the atoms transfer to a U-shaped wire on the chip surface. We have achieved near unity transfer efficiency. Once in the U-trap, the atoms can transfer into a Z-trap and single wire guides. We report on investigations of manipulating atoms with external gradients, and splitting into reflected and transmitted components as they traverse a potential barrier. We also discuss results of studies to precisely control the output coupling of the atoms into the guide. Pulse sequences are designed that mix steady states or transient regimes with a free evolution time of the metstable ground state coherence, with the goal to optimally recover the clock information prepared by EIT. Raman-Ramsey nutations are then demonstrated using a set of effective damped two-level Optical Bloch equations. These light shifts can be expressed as phase shifts in the cosine function describing the Raman-Ramsey oscillations resulting in a frequency shift of the central fringe minima. Siemers et al, EuroPhys. Santra et al, Phys. Hong et al, Phys. Zanon et al, Phys. Thomas et al, Phys. This allows us to simultaneously probe the spectral and quantum statistical properties of narrow-bandwidth single-photon pulses, revealing that their quantum nature is preserved under EIT propagation and storage. We measure the time delay associated with the reduced group velocity of the single-photon pulses and report observations of their storage and retrieval. Finally, we discuss experimental progress towards application of these results to long-distance quantum communication. The control is provided by an appropriately shaped classical laser field. We present a universal theoretical framework for analyzing various approaches to pulse storage ranging from adiabatic reduction of photon pulse group velocity and pulse propagation control via off-resonant Raman fields to photon-echo based approaches. We show that when properly optimized these three approaches yield identical efficiency. We extend our model to include Doppler broadening and, in particular, show that at high enough OD Doppler broadening is irrelevant. Investigation of lasing from dye doped plastics using flash lamp and Nd: The host materials examined are poly methyl methacrylate [acrylic], epoxy, polyester and polyurethane. Various solvents are used to improve dye dispersion within the material. Two forms of excitation flash lamp and frequency doubled Nd: YAG pumped dye lasers, a disk of dye doped

plastic is mounted in a housing to provide random orbital motion. The disk is within a Littmann configuration cavity. Each dye disk is tested for threshold, durability, power output, bandwidth, and tuning range. An end pumped cylinder is also explored. For the flash lamp pumped dye lasers two configurations are used: A monolithic cavity for the flash lamp pumped system is investigated. Marjatta Lyyra We observed the electromagnetically induced transparency and dark fluorescence in a Lithium molecule. We used density matrix methods to simulate the response of an open molecular three-level system to the action of a strong coupling field and a week probe. The analytical solutions obtained under the steady state condition are in excellent agreement with the experimental spectra. We show that the coherence is remarkably preserved even when the coupling field was detuned far from the resonance transition. Zibrov, Vladan Vuletic, Mikhail D. Lukin Cold atoms trapped inside a hollow core photonic bandgap fiber create medium with unique optical properties, such as large optical depth and long coherence times. Furthermore, the fiber itself guides the interacting light in tight spatial confinement over distances not limited by diffraction and dramatically increases electric field intensity. Optical nonlinearities achievable under these conditions can be potentially used for coherent nonlinear interactions between single photon light pulses. In this work we present an atom cooling and trapping setup that loads cold Rb atoms into a dipole trap localized within the hollow core of the fiber and we study properties of the cold Rb atoms confined in the fiber. The application in a bound exciton system in a magnetic field for the purposes of obtaining electromagnetically induced transparency is discussed. In particular, Stokes and Anti Stokes couplings have been experimentally observed in such a system. Brian Kennedy We investigate the dynamics of dark-state polaritons in an atomic ensemble with ground-state degeneracy. A signal light pulse may be stored and retrieved from the atomic sample by adiabatic variation of the amplitude of a control field. During the storage process, a magnetic field causes a rotation of the atomic hyperfine coherences, leading to collapses and revivals of the dark-state polariton number. These collapses and revivals are observed in measurements of the retrieved signal field, as a function of storage time and magnetic field orientation.

Chapter 2 : DuPont USA | Global Headquarters

From flying hot-blooded squirrels and diminutive kinglets to sleeping black bears and torpid turtles to frozen insects and frogs, the animal kingdom relies on staggering evolutionary innovations to survive winter.

Abstract The epidemiological transition model describes the changing relationship between humans and their diseases. The first transition occurred with the shift to agriculture about 10, YBP, resulting in a pattern of infectious and nutritional diseases still evident today. In the last two centuries, some populations have undergone a second transition, characterized by a decline in infectious disease and rise in degenerative disease. We are now in the throes of a third epidemiological transition, in which a resurgence of familiar infections is accompanied by an array of novel diseases, all of which have the potential to spread rapidly due to globalization.
Introduction The epidemiological transition model provides a means for understanding the evolution and spread of emerging diseases [1 â€" 3]. As originally formulated by A. Omran, it described the major transition in mortality rates observed in high-income countries by partitioning history into three time periods: Since its introduction several decades ago, important modifications to the model have been made, including the delineation of additional major transitions [3]. To date it has received scant attention from epidemiologists, however [16]. While the epidemiological transition model has been discussed in some epidemiological journals [17 â€" 21], overall this framework for understanding the prevalence of different types of diseases has had little impact in the field. Why might this be? In many of the disciplines mentioned above, in which the epidemiological transition model has been most influential, investigators are primarily concerned with health writ large or all-cause mortality rather than individual diseases. Therefore, a model that helps explain a major transition in the human disease-scape is viewed as useful, providing insight into ultimate causes and possible solutions aimed at improving health. In contrast, in epidemiology investigators are often concerned with one disease at a time. The identification of a novel pathogen or the characterization of a new disease requires epidemiologists to pinpoint, as quickly as possible, the properties specific to it: Thus, in epidemiological studies emerging diseases are usually conceptualized as individual entities that can be attributed to particular proximate causes, rather than members of a suite of diseases that are increasing simultaneously due to common, ultimate causes. Though it is certainly important to recognize and describe the particulars of a given pathogen, we argue in this paper that synthesizing such data using the epidemiological transition theory is likely to prove useful to epidemiologists as well. Situating a disease within a particular context using the transition model may provide clues to possible proximate as well as ultimate causes, prevention strategies, and predictions regarding future trends. In this article, we describe past and present epidemiological transitions. In addition to considering evolutionary factors in the emergence of disease, we will incorporate the spread of drug resistance and explore the implications of globalization in expanding the threat posed by some diseases. We also discuss how the epidemiological model allows us to examine the recent rise of certain classes of disease, such as the frequency of allergies and autoimmune diseases, in high-income countries. Finally, we discuss the ways in which increased attention from epidemiologists may clarify and improve the model. This shift occurred as a result of higher standard of livings and the introduction of medical and public health practices in high-income nations undergoing industrialization. This epidemiologic transition, according to Omran, occurred in three successive phases, as described above, and took about two centuries until completion in Western Europe and the United States. Epidemiological transition theory is derived from demographic transition theory. Demographic transition theory, first proposed by Thompson [22] and expanded by Notestein [23] and Davis [24], is a generalized model of population structure that is the basis for understanding fertility and mortality processes in contemporary populations Figure 1. In the first stage, thought to represent most of human evolutionary history, populations experience

near maximal fertility and mortality rates, resulting in little increase in population size. In the second stage, populations experience a decrease in mortality rates while fertility rates remain high, resulting in a rapid increase in population size. In the third stage, mortality rates are low and birth rates begin to decline, resulting in slowed population growth. In the last stage, low mortality and fertility rates result in no increase in population size. Epidemiologic transition theory explains an important component of the demographic transitions by describing the varying patterns of disease that are important contributors to mortality.

Chapter 3 : The Hydra Library

Hormonal control of lipolysis from the white adipose tissue of hibernating jerboa Behrisch H. W., Smullin D. H., and Morse G. A. () Life at low and changing.

Advanced Search Abstract The development, reproduction and longevity of corn aphids Rhopalosiphum padi L. Only nymphs of R. Rhopalosiphum padi performed better than M. The better performance of R. Sitobion avenae had a higher rm than M. The role of temperature as a key factor in determining aphid population dynamics in the northeastern Iberian peninsula is discussed. Corn is the main summer arable crop, covering almost 50, ha in irrigated lands. The acreage is increasing as more land is under irrigation. Although their economic importance varies with time and space. The population dynamics of the three aphid species on corn have been studied in the region and showed three distinct periods: A similar pattern has also been recorded in other countries of the Mediterranean Basin Moreau , Chansigaud and Vaillant The factors affecting the population dynamics have not been sufficiently studied, but some causes have been suggested Pons et al. The effect of temperature on aphid performance on winter cereals has been studied by several authors Dean , Lykouressis , Kieckhefer et al. However, no data about aphids feeding on corn are known except those of Kuroli for R. Temperature is the main abiotic factor affecting aphid bionomics Campbell et al. This article reports the effect of temperature on development, reproduction and survival of the corn aphids, R. Corn was grown in the glasshouse in clay pots 16 cm in diameter and 15 cm high until the plants had six complete expanded leaves. Only the central part of the fourth leaf was used in the experiment. The experiment consisted in exposing cohorts of R. The following temperatures were used: In the case of M. To confine the aphids, transparent cylindrical plastic cages 53 mm in diameter, 32 mm high were used. Previous to their use, the cages were immersed in a solution of 0. To compare the temperature and relative humidity of the chamber with those inside the cage, temperature and relative humidity loggers StowAway, Onset Computer, Pocasset, MA were connected to some cages. One alatiform fourth instar F0 generation was caged individually, containing a piece of corn leaf about 40 mm long from plants reared in the glasshouse placed on a disc of filter paper wet with distilled water. The resulting alate F0 was left in the cage until it had produced offspring F1 generation or for a maximum of 3 d, whichever came first. Every day the cage was replaced with a clean one containing a wet disc of filter paper. However, while the nymphs were in the first instar, the piece of fresh leaf was added into the cage and the old one was not removed, allowing the aphids to change to the new leaf when they wished. The maximum time that a piece of leaf was left within the cage was 4 d. The nymphs were allowed to develop to adults within the cages, and their developmental stage was recorded daily to allow the developmental time Td to be estimated. Nymphal mortality was recorded. When the F1 aphids were adults, some of them were caged individually and fed with pieces of corn leaf as before. These aphids were used to determine the following: The aphids in cages were monitored at h intervals. Cast skins and nymphs that died or were born were removed each day from the cages when the aphids were monitored. Means were separated using Student-Newman-Kuels test. We also used this model to fit the relationship between temperature and values of developmental and prereproductive rates and some of the parameters describing reproductive capacity rates of effective fecundity and total fecundity and intrinsic rate of increase obtained in the experiment for R. The results of nymphal mortality, development and reproductive capacity and longevity of R. Values within an column, followed by the same letter are not significantly different according to the Student-Newman-Keuls test. Table 2 Development of R. For each aphid species and variable, values within a column followed by the same letter are not significantly different according to the Student-Newman-Keuls test.

Chapter 4 : The Changing Disease-Scape in the Third Epidemiological Transition

Glucose oxidation by adipose tissue of the edible Behrisch H. W., Smullin D. H. and Morse G. A. () Life at low and changing temperatures: molecular aspects.

The Mediterranean fruit fly Ceratitis capitata Wied. Studies on myrmelionid insects. On an ichneumonid parasitic upon the pupa of a myrmelionid. Parasitic insectes on the pupa of Cystidia stratonice Stoll. On some ecological observations on Bembix nipponica Smith. Note on the nest of Sphex nigellus. Homoptera, Coccoidea and measures for its control in Armenia. Study to Trichogramma dendrolimi [Hym.: Trichogrammatidae], description of a new subspecies. A new nutrient medium for culturing predacious Hyphomycetes. On the effects of temperature n the sex ratios in the populations of far eastern Prospaltella, a parasite of San Jose scale. Ghiandole labialie fabbricazione del bozzolo negli Imenotteri Ricerche Ichneumonidi e Braconidi. The Italian cochineal insects on Cupressaceae. Ricerche sulla sterilizzazione di Insetti nocivi con radiazioni ionizzanti. Direct and indirect interactions between ants Pheidole megacephala , scales Coccus viddis and plants Pluchea indica. Effects of plant density and diversity on the population dynamics of a specialist herbivore, the striped cucumber beetle, Acalymma vittatta Fab. Effects of plant diversity and time of colonization on an herbivore-plant interaction. Contribution to the terminology of the life habits of entomophagous parasites. Experimentelle entomologische studien vom physikalisch- chemischen standpunkt aus; vol. Uber die einburgerung des schildlausparasiten Leptomastix dactylopii und anderer nutzlinge im spanisch zitrusanbau. The Mediterranean fruit fly in Bermuda. Dange of introducing fruit flies into the United States. A new parasite of Anthrenus vorax Waterhouse. Life history of the melon fly. Parasitism among the larvae of the Mediterranean fruit fly C. Life-history of the Mediterranean fruit fly from the standpoint of parasite introduction. Parasitism among the larvae of the Mediterranean fruit fly Ceratitis capitata in Hawaii in The melon fly in Hawaii. The Mediterranean fruit fly in Hawaii. The Mediterranean fruit fly. Phytoseiidae] as a predator of the tomato erineum mite, Eriophyes lycopersici [Acarina: Biology of Oligota oviformis Casey Coleoptera: The biology of Spiloconis picticornis Banks Neuroptera: Coniopterygidae introduced into California from Hong Kong. Badii, M H; Hernandez, E. Effect of different foods on development, reproduction and survival of Phytoseiulus persimilis [Acarina: Feeding behavior of some phytoseiid predators on the broad mite, Polyphagotarsonemus latus [Acari: Eine Fliege vernichtet den Samen von Carduus sp. Ihre Lebensweise, wirtschaftticke Bedeutung und systematische Kennzeichnung. Ihre Lebensweise wirtschaftticke Bedeutung und systematische Kennzeichnung. On the life-history of Ammophila campestris Jur. Fortpflanzungsverhalten und Orientierung der Grabwespe Ammophila campestris Jur. Specializations in organs and movement with a releasing function. Ethological studies of insect behavior. Waarnemingen over de levenswijze van der kleine rapsendooder Ammophila campestris Jrn. Levende Natuur, Amsterdam Embryological and ecological investigations on the development of the egg of Ammophila campestris Jur. An unusual case of parasitism on Clastoptera obtusa Say. Nota sobre a aplicao da luta biological na companha da Lymantria. Life-history and biolomics of two predaceous and one mycophagous species of Coccinellidae. Observations sur la biologie de deux mineuses du genre Lithocolletis: Gracilariidae nuisibles aux arbres fruitiers en Suisse romande. Essai de lutte contre la mineuse sinueuse du feuillage des arbres fruitiers Lyonetia clerkella L. The biology and the parasite complex of the iris whitefly, Aleyrodes spiraeoides Quaintance. Field experiences with juvenile hormone mimics, p. Vergleichend-histopathologische Untersuchungen an nosemakranken Honigbienen. Recognition of heterospecific parasitism: Journal of insect Bebavior, 4: Patterns of host exploitation by the parasitoid wasp Trichogramma minutum Hymenoptera: Trichogrammidae when attacking eggs of the spruce budworm Lepidoptera: Tortricidae in Canadian forests. The effects of honey, host egg size and number of wasp progeny per host egg on the size, fecundity and longevity of Trichogramma pretiosum. Forced air for separating pupae of house flies from rearing medium. Improved techniques for mass rearing Anopheles albimanus, pp. Quarantine laboratory for plant-feeding

insects, pp. Aetiology of European foul brood; a disease of the larval honeybee. European foul brood; a disease of the larval honeybee Apis mellifera L. The isolation and cultural characteristics of Streptococcus pluton and further observations on Bacterium eurydice. An improved method for the isolation of Streptococcus pluton, and observations on its distribution and ecology. Recent research on the natural history of European foul brood disease. The natural mechanism of suppression of Nosema apis Zander in enzootically infected colonies of the honey bee, Apis mellifera Linnaeus. The epizootiology of European foulbrood of the larval honey bee, Apis mellifera Linnaeus. Infectious Diseases of the Honey Bee. The effect of Acarapis woodi on honeybees from North America. The safety of pest-insect pathogens for beneficial insects, p. Viruses and Hymenoptera, p. Manual of Cultivated Plants. Two viruses from adult honey bees Apis mellifera Linnaeus. The milipede parasitoid Pelidnoptera nigripennis F. Sciomyzidae for the biological control of the millipede Ommatoiulus moreleti Lucas Diplopoda: Facultative parasitism and dietary change in Harmolita hyalipenne Walker. The biology of the bean thrips. On the interaction between several species of hosts and parasites. The peach twig borer. The interaction between hosts and parasites. Laboratory rearing of the predatory coccinellid Cleobora mellyi [Col.: Coccinellidae] for biological control of Paropsis charybdis [Col.: Chrysomelidae] in New Zealand. Record of an ichneumon, Phygadeuon cylindraceus attacking Spathiophora hydromyzina Dipt. Some notes on the natural control of the cherry-tree ugly nest tortricid, Archips cerasivorana Fitch. Some notes on the female reproductive organs in the Hymenoptera. Biological control of greenhouse insects. Biological control of insect pests in Canada with special reference to the European spruce sawfly Gilpina polytoma Htg. Laboratory propagation of parasites and its place in biological control programs.

Chapter 5 : Shell growth in estuaries - Wikipedia

Figure 1. Upper panels: Typical dynamic changes of body temperature (via radiotelemetry) during torpor bout in the Richardson's ground squirrel under field (#33) and laboratory (#) conditions.

Details of carbonate usage[edit] The saltwater clam known as the Northern quahog , Mercenaria mercenaria, thrives in the muddy sands of estuaries. There are several variations in calcium carbonate CaCO3 skeletons, including the two different crystalline forms, calcite and aragonite, as well as other elements which can become incorporated into the mineral matrix, altering its properties. Calcite is a hexagonal form of CaCO3 that is softer and less dense than aragonite , which has a rhombic form. The amount of magnesium Mg incorporated into the mineral matrix during calcium carbonate deposition can also alter the properties of the shell, because magnesium inhibits calcium deposition by inhibiting nucleation of calcite and aragonite. There are costs to producing thicker shells as protection, including the energetic expense of calcification, limits on somatic growth, and reduced growth rates in terms of shell length. Temperature and salinity also affect shell growth by altering organismal processes, including metabolism and shell magnesium Mg incorporation, as well as water chemistry in terms of calcium carbonate solubility , CaCO3 saturation states , ion-pairing , alkalinity and carbonate equilibrium. Acidity pH and carbonate saturation states also reach extremes in estuarine systems, making these habitats a natural testing ground for the impacts of chemical changes on the calcification of shelled organisms. Carbon dioxide from the atmosphere and from respiration of animals in estuarine and marine environments quickly reacts in water to form carbonic acid , H2CO3. Since acidic conditions promote shell dissolution, the alkalinity of the water is positively correlated with shell deposition, especially in estuarine regions that experience broad swings in pH. The values for K1 and K2 can be influenced by several different physical factors, including temperature, salinity and pressure, so organisms in different habitats can encounter different equilibrium conditions. Many of these same factors influence solubility of calcium carbonate, with the solubility product constant Ksp expressed as the concentration of dissolved calcium and carbonate ions at equilibrium: The saturation state of calcium carbonate also has a strong influence on shell deposition, with calcification only occurring when the water is saturated or supersaturated with CaCO3, based on the formula: The two forms of CaCO3 have different saturation states, with the more soluble aragonite displaying a lower saturation state than calcite. Since aragonite is more soluble than calcite and solubility increases with pressure, the depth at which the ocean is undersaturated with aragonite aragonite compensation depth is shallower than the depth at which it is undersaturated with calcite calcite compensation depth. As a result, aragonite-based organisms live in shallower environments. Effect of temperature on calcification[edit] Water temperatures vary widely on a seasonal basis in polar and temperate habitats, inducing metabolic changes in organisms exposed to these conditions. Seasonal temperature swings are even more drastic in estuaries than in the open ocean due to the large surface area of shallow water as well as the differential temperature of ocean and river water. During the summer, rivers are often warmer than the ocean, so there is a gradient of decreasing temperature towards the ocean in an estuary. This switches in the winter, with ocean waters being much warmer than river water, producing the opposite temperature gradient. Temperature is changing on a larger time scale as well, with predicted temperature changes slowly increasing both freshwater and marine water sources though at variable rates , further enhancing the impact that temperature has on shell deposition processes in estuarine environments. Limacina helicina , a pteropod Temperature also has a large impact on the saturation state of calcium carbonate species, as the level of disequilibrium degree of saturation strongly influences reaction rates. This particularly affects pteropods since they have thin aragonite shells and are the dominant planktonic species in cold Arctic waters. While oysters are benthic and use calcite instead of aragonite like pteropods , there is still a clear increase in both calcite saturation level and oyster calcification rate at the higher temperature treatments. Ca ratios, as the foraminiferan Ammonia tepida increases its Mg: Ca ratios as well as on solubility and saturation state of

calcite and aragonite, it is clear that short- or long-term temperature variations can influence the deposition of calcium carbonate by altering seawater chemistry. The impact that these temperature-induced chemical changes have on shell deposition has been repeatedly demonstrated for a wide array of organisms that inhabit estuarine and coastal systems, highlighting the cumulative effect of all temperature-influenced factors. A live Monetaria annulus The blue mussel Mytilus edulis is a major space occupier on hard substrates on the east coast of North America and west coast of Europe, and the calcification rate of this species increases up to five times with rising temperature. The cowry a sea snail Monetaria annulus displayed a positive correlation between sea surface temperature SST and the thickness of the callus, the outer surface of juvenile shells. Sclerochronology can reconstruct historical temperature data from growth increments in shells of many calcifying organisms based on differential growth rates at different temperatures. Salinity varies even more widely than temperature in estuaries, ranging from zero to 35, often over relatively short distances. Even organisms in the same location experience broad swings in salinity with the tides , exposing them to very different water masses with chemical properties that provide varying levels of support for calcification processes. Even within a single estuary, an individual species can be exposed to differing shell deposition conditions, resulting in varied growth patterns due to changes in water chemistry and resultant calcification rates. Ca ratios, though shows only about half as much influence as temperature. The slopes of these lines are the same, with only the intercept changing for the different carbonate species, highlighting that at standard temperature and pressure, aragonite is more soluble than calcite. Apparent solubility product is tied to salinity because of the ionic strength of the solution and the formation of cation-carbonate ion pairs that lower the amount of carbonate ions that are available in the water. Shell deposition[edit] All of these aspects of shell deposition are affected by salinity in different ways, so it is useful to examine the overall impact that salinity has on calcification rates and shell formation in estuarine organisms, especially in conjunction with temperature, which also affects calcification. This is likely a result of the increased alkalinity and calcium carbonate saturation states with salinity, which combine to decrease free hydrogen ions and increase free carbonate ions in the water. Increases in salinity and temperature can counteract the negative impact of pH on calcification rates, as they elevate calcite and aragonite saturation states and generally facilitate more favorable conditions for shell growth. Future changes[edit] Shell growth and calcification rate are the cumulative outcome of the impacts of temperature and salinity on water chemistry and organismal processes such as metabolism and respiration. It has been established that temperature and salinity influence the balance of the carbonate equilibrium, the solubility and saturation state of calcite and aragonite, as well as the amount of magnesium that gets incorporated into the mineral matrix of the shell. All of these factors combine to produce net calcification rates that are observed under different physical and environmental conditions. Organisms from many phyla produce calcium carbonate skeletons, so organismal processes vary widely, but the effect of physical conditions on water chemistry impacts all calcifying organisms. Climate change[edit] Satellite view of Chesapeake Bay center and Delaware Bay top , on the east coast of the USA With changing climate, precipitation is predicted to increase in many areas, resulting in higher river discharge into estuarine environments. However, this may be mitigated by increased temperature due to global warming, since elevated temperature result in lower solubility and higher saturation states for calcite and aragonite, facilitating $CaCO_3$ precipitation and shell formation. Calcification rates[edit] The limiting factor in shell deposition may be saturation state , especially for aragonite, which is a more soluble and less stable form of $CaCO_3$ than calcite. By , pCO_2 of and pH drop to 7. The following â€" years may see pCO_2 increase to , pH drop to 7. The interaction between pH, temperature and salinity in estuaries and in the world ocean will drive calcification rates and determine future species assemblages based on susceptibility to this change. One problem with counting on increased temperature to counteract effects of acidification on calcification rate is the relationship between temperature and Mg: Ca ratios, as higher temperature result in higher amounts of magnesium incorporated into the shell matrix. Ca ratios are more soluble, so even organisms with primarily calcite less soluble than aragonite skeletons may be heavily impacted by future conditions.

Chapter 6 : Full text of "Lehigh Alumni Bulletin (volume 29, no. 8)"

High activities of cathepsins D, H, and L in the white muscle of chum salmon in spawning migration Yamashita, M.; Konagaya, S. The effects of starvation and acclimation on pentose phosphate pathway dehydrogenases in brook trout liver.

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population continues to grow rapidly, AD represents an imminent social as well as medical problem. The pathology of AD has been reviewed extensively and comprises multiple and varied factors 6,7. As discovered by Alzheimer, two of the major hallmarks are plaques and tangles. The tangles are paired helical filaments made of hyperphosphorylated tau 8. Tangles occur in living neurons but also are found as extracellular remains following nerve cell death. Plaques exhibit varied morphologies 9â€" The most salient are senile plaques that show degenerating neurites in proximity to large extracellular amyloid deposits. Molecular Mechanisms of Neurodegenerative Diseases Edited by: Other major hallmarks of AD-afflicted brain are inflammatory gliosis 14 and selective nerve cell degeneration and death 15â€"18 , especially in limbic and cognitive centers. Current thinking is that molecules associated with the hallmark pathologies play an active role in AD pathogenesis. Constituent molecules can act as toxins, toxin inducers, and toxin mediators. As yet, however, no consensus exists regarding the primary pathogenic molecules. Nonetheless, central roles also can be argued for inflammatory processes 23 and for cytoskeletal dysfunction linked to aberrant tau phosphorylation 24â€" Whichever molecular abnormality proves primary, the pathogenic phenomena are closely interrelated. If these mechanisms ultimately are shown responsible for AD, they will provide molecular targets for drugs that block disease progression and perhaps even reverse early-stage memory loss. There is only a single APP gene, but it has five splice variants 21,41â€"43 , and related sequences show the existence of an amyloid precursor protein APP gene family 44, APP itself is an integral membrane protein with one transmembrane domain. The peptide is secreted and also found within intracellular compartments The first mutation identified was a highly conserved substitution in the APP transmembrane domain Val â€" Ile This single, simple change in the APP gene evokes full AD pathology, including formation of tangles as well as plaques. Although no single animal mimics all of AD pathology, current strains exhibit multiple aspects of neuronal dysfunction and degeneration and a variety of behavioral deficiencies. Other genetically linked factors besides mutant APP have a role in AD and, in fact, are significantly more prevalent. Mechanisms responsible for this elevation are unclear, although the mutant presenilin effects likely are linked to the role of presenilin as APP protease 71, This, however, is not the case, as shown in the capstone discovery by Yankner et al. Prior to death, affected neurons show increases in phosphotau antigens associated with neurofibrillary tangles 28, In vivo, gliosis is induced 79, Factors that influence sensitivity may include cell cycle withdrawal, increased demand for trophic support, switchover from anaerobic to aerobic metabolism, or altered expression of signal transduction molecules. Solutions initially comprise monomeric peptide and are essentially innocuous. Toxic solutions examined by electron microscopy or atomic force microscopy show abundant fibrils 84,96, These appear analogous to fibrils that constitute amyloid in AD-afflicted brain tissue 98, Solutions containing large amorphous aggregates appear nontoxic. Extrapolating to AD, the cascade responsible for dementia theoretically would be initiated by fibrils of neuritic amyloid plaques. Fibrillogenesis has been the subject of intense investigation for reviews, see refs. A lag phase also occurs kinetic solubility , during which peptide slowly undergoes prerequisite associations. It has been pointed out that critical concentrations for fibrillogenesis are orders of magnitude higher than concentrations found in cerebrospinal fluid CSF 93,, However, analogous to neurotransmitter levels, there is no obvious relationship between concentrations in CSF and concentrations that develop in a local extracellular milieu or inside cells. Although this dose may seem high, molarity has little meaning with respect to insoluble assemblies such as fibrils. It also is clear from EM data that fibrils can interact strongly with neuronal cell surfaces. Such fibrilâ€"neuron contact in AD might be expected to produce local degeneration, as seen in neuritic plaques. Selkoe has identified five strategic drug classes based on this goal The most appealing would act furthest upstream, blocking fibril formation. However, as discussed in the following, compounds that only block fibril toxicity may prove insufficient as AD therapeutic drugs. A particular problem with the fibril hypothesis is the imperfect correlation between amyloid abundance and dementia. This issue has been discussed extensively 25,â€" Some studies have concluded that decreased synaptic density and the abundance of tangles are more germane than plaques to the progression of dementia. Various explanations have been offered to account for

the imperfect correlation , , including the argument that better data analysis and selection of plaque subtype show improved correlation It appears, however, that amyloid plaques can be abundant in individuals without dementia â€" Moreover, examined closely in the hippocampus, the majority of neuron loss occurs in the absence of any proximal amyloid , Lack of correlation between amyloid levels and neurological deficits has been mimicked in several strains of APP transgenic animals. The authors conclude that neural loss is plaque independent. Other recent studies as well as earlier works also have reported amyloid-free transgenic mice that exhibit multiple aspects of pathology and behavioral anomalies 60,â€" Transgenic animals with neural deficits in the absence of amyloid once were considered poor models of AD pathogenesis. Such diffusible oligomers, however, have been observed in various biochemical, cell culture, and human pathology studies and may even be present to varying degrees in classic fibril preparations Until recently, these small oligomers were considered transient intermediates, en route to fibrils, but new evidence indicates they exist as independent toxic entities. The oligomers are upregulated in cells co-transfected with mutant presenilin genes 70 , as expected from AD pathology. The small oligomers exist in a fibril-free conditioned medium, consistent with biochemical stability. Thus, coupling of oligomers to fibrillogenesis is not an obligatory reaction. Oligomers first were detected in smooth muscle of CNS vessel walls as part of a study of amyloid angiopathy Their presence was thought to be a potential indicator of amyloidogenesis. The authors concluded that 10 Klein upregulation of oligomers most likely reflected ongoing amyloidogenesis, but speculated the oligomers might be bioactive. Because, as shown next, small oligomers can be neurotoxic, their occurrence in AD brain would explain the imperfect correlation between dementia and plaques and provide a new focus for therapeutic drug development. The prediction has potential practical value because fibril blockers would be prototypes for rationally designed therapeutic drugs.

Nongenetic variation, genetic-environmental interactions and altered gene expression. III. Prosttranslational modifications Nongenetic variation, genetic-environmental interactions and altered gene expression.

His father, James Roosevelt I, graduated from Harvard Law School in , but chose not to practice law after receiving an inheritance from his grandfather, James Roosevelt. At age nine he attended public school in Germany. He took up golf in his teen years, becoming a skilled long hitter. Its headmaster, Endicott Peabody , preached the duty of Christians to help the less fortunate and urged his students to enter public service. Roosevelt entered Columbia Law School in , but dropped out in after passing the New York bar exam. She attempted to break the engagement several times. The home was owned by Sara Roosevelt until her death in and was very much her home as well. Like his father had, Franklin left the raising of the children to his wife, while Eleanor in turn largely relied on hired caregivers to raise the children. Referring to her early experience as a mother, she later stated that she knew "absolutely nothing about handling or feeding a baby. Anna , James , and Elliott were born in , , and , respectively. Another son, also named Franklin , was born in , and the youngest child, John , was born in Franklin contemplated divorcing Eleanor, but Sara objected strongly and Lucy would not agree to marry a divorced man with five children. Eleanor never truly forgave him, and their marriage from that point on was more of a political partnership. The emotional break in their marriage was so severe that when Roosevelt asked Eleanor in â€"in light of his failing healthâ€"to come back home and live with him again, she refused. He and Lucy maintained a formal correspondence, and began seeing each other again in , or perhaps earlier. Roosevelt held little passion for the practice of law and confided to friends that he planned to eventually enter politics. Rather than putting his political hopes on hold, Roosevelt ran for a seat in the state senate. In the U. Senate election , which was determined in a joint session of the New York state legislature, [c] Roosevelt and nineteen other Democrats caused a prolonged deadlock by opposing a series of Tammany-backed candidates. Finally, Tammany threw its backing behind James A. Overcoming a bout with typhoid fever , and due to the help of journalist Louis McHenry Howe , Roosevelt was re-elected in the elections. After the elections, he served as chairman of the Agriculture Committee, and his success with farm and labor bills was a precursor to his New Deal policies twenty years later. Glynn , he faced a formidable opponent in the Tammany-backed James W. Roosevelt learned a valuable lesson, that federal patronage alone, without White House support, could not defeat a strong local organization. Though he remained publicly supportive of Wilson, Roosevelt sympathized with the Preparedness Movement , whose leaders strongly favored the Allied Powers and called for a military build-up. Congress approved the declaration of war on Germany on April 6. For the next year, Roosevelt remained in Washington to coordinate the mobilization, supply, and deployment of naval vessels and personnel. On the day voyage, the pandemic influenza virus struck and killed many on board. Roosevelt became very ill with influenza and a complicating pneumonia, but he recovered by the time the ship landed in New York. Roosevelt and his associates approached Herbert Hoover about running for the Democratic presidential nomination, with Roosevelt as his running mate. After Governor James M. Roosevelt resigned as Assistant Secretary of the Navy after the Democratic convention and campaigned across the nation for the Coxâ€"Roosevelt ticket. Harding and Calvin Coolidge in the presidential election by a wide margin, and the Republican ticket carried every state outside of the South. The election also saw the first public participation of Eleanor Roosevelt who, with the support of Louis Howe , established herself as a valuable political ally. His main symptoms were fever; symmetric, ascending paralysis; facial paralysis; bowel and bladder dysfunction; numbness and hyperesthesia; and a descending pattern of recovery. Roosevelt was left permanently paralyzed from the waist down. Photo taken by his cousin Margaret Suckley February He usually appeared in public standing upright, supported on one side by an aide or one of his sons. To create the rehabilitation center, Roosevelt assembled a staff of physical therapists and used most of his inheritance to purchase the Merriweather Inn. In , Roosevelt founded the National Foundation

for Infantile Paralysis , leading to the development of polio vaccines.

Chapter 8 : Full text of "Fluid Power Control"

Behrisch HW, Smullin DA, Morse GA () Life at low and changing temperatures: molecular aspects. In: Musacchia XJ, Jansky L (eds) Survival in the cold: hibernation and other adaptation. Elsevier North-Holland, Amsterdam, pp Google Scholar.

References Abstract Environmental temperature can have a surprising impact on extremity growth in homeotherms, but the underlying mechanisms have remained elusive for over a century. Limbs of animals raised at warm ambient temperature are significantly and permanently longer than those of littermates housed at cooler temperature. This phenotypic growth plasticity could have adaptive significance for thermal physiology. Shortened extremities help retain body heat in cold environments by decreasing surface area for potential heat loss. Environmental modulation of tissue temperature can have direct and immediate consequences on cell proliferation, metabolism, matrix production, and mineralization in cartilage. Temperature can also indirectly influence cartilage growth by modulating circulating levels and delivery routes of essential hormones and paracrine regulators. Using an integrated approach, this article synthesizes classic studies with new data that shed light on the basis and significance of this enigmatic growth phenomenon and its relevance for treating human bone elongation disorders. Recent advances in imaging modalities that enable the dynamic study of cartilage growth plates in vivo will be key to elucidating fundamental physiological mechanisms of long bone growth regulation. Comprehensive Physiology offers downloadable PowerPoint presentations of figures for non-profit, educational use, provided the content is not modified and full credit is given to the author and publication. Download a PowerPoint presentation of all images Figure 1. Examples of some of the environmental inputs on bone elongation red. The functional outputs of the skeleton gray are kept in physiological balance with the inputs to maintain homeostasis. Movement, for example, is a functional role of the skeleton. Lack of movement inactivity , however, can cause mineral loss and reduced elongation rate. Final bone length is the product of a complex interplay of genetic and environmental factors that act on multiple levels during postnatal skeletal growth. Temperature is often underrecognized for its contribution to bone lengthening. Schematic of a long bone growth plate and principal blood supplies. Image at right shows the proximal tibial growth plate from a mouse that was injected with oxytetracycline OTC to label newly formed bone. Orientation matches the schematic on the left. The growth plate appears as a dark band between OTC fluorescence in epiphyseal and metaphyseal bone. The perichondrium and vascular network remain intact. The growth plate is comprised of a heterogeneous collection of chondrocytes located between the ossified epiphysis and metaphysis of immature long bones. Growth plates are conventionally subdivided into morphologically and functionally distinct regions: Temperature effects on femur length in mice. The underlying cause of such effects is not immediately obvious since homeotherms maintain tightly regulated internal body temperatures independent of their external environment [original text and image, from Serrat et al. Caudal end of pigs demonstrating temperature effects on extremity growth in mammals. This illustrates the major impact that temperature can have on the phenotype of a growing animal [reproduced, with permission, from Weaver and Ingram, , reference , p. Growth curves demonstrate that mouse tail elongation rate is impacted by ambient rearing temperature without affecting body mass. These results demonstrate that the temperature growth response is almost immediate and is limited to the extremities tissue temperatures are shown in Figure 8. Animals were studied at different endpoints between 4. The significant correlations indicate that the temperature impact on tail length, which can be measured noninvasively over the course of an experiment, is a good proxy for the effect on limb length [original data, with permission, from Serrat, , reference]. Diagram illustrating some of the major physiological routes through which temperature can influence bone elongation rate. The solid lines indicate direct temperature effects. The dashed lines are intended to show several indirect ways that temperature can alter bone growth. Many temperature effects on bone lengthening occur by indirect mechanisms involving the

endocrine and vascular systems by changing the amount of hormones and nutrients that reach cartilage growth plates, the sites of bone elongation. Other than cartilage canals present in larger mammals, growth plates do not have a direct penetrating blood supply and solutes are delivered to cartilage by transport from the surrounding vasculature. Heat and cold exposure can also alter the concentration of circulating hormones that are important for regulating longitudinal growth, such as thyroid hormone, leptin, estrogen and glucocorticoids. These cellular processes can also indirectly affect growth by changing the physical properties of cartilage and its surrounding blood vessels in such a way that alters the transport of critical nutrients and growth factors. Since blood is also a major source of heat, changes in blood flow could indirectly modulate tissue temperature and elicit direct cellular reactions. This highlights that it is essential to perform whole animal in vivo studies, because the level of complexity of an intact organism with intact circulation cannot be adequately modeled by in vitro studies alone original artwork by Tom Pickens and Matt Crutchfield, Graphic Designers, Marshall University School of Medicine. Average peripheral temperature of the ear left and tail right of 6. Temperatures were measured weekly using a noncontact thermometer at the tail base and ear. Growth curves are shown in Figure 5. Total tail growth was measured as change in length from start. Ear area was measured at the endpoint. After only 3 weeks in the housing conditions, extremity temperature and extremity growth in these littermate mice showed a remarkable covariation with ambient temperature as demonstrated in the scaled cartoon at the top. These results suggest that there are direct temperature effects on developing cartilaginous tissues in the heterothermic appendages original artwork, with permission, by Matt Crutchfield, Graphic Designer, Marshall University School of Medicine. Histological analysis of proximal tibial growth plates from 4. Orientation matches Figure 2. Growth plate morphology was unexpectedly similar at cold and warm temperatures. There were no major appreciable differences in overall size, shape, or organization of the cartilage. These results suggest that the dynamic events contributing to the bone elongation differences cannot be adequately captured in a postmortem histology snapshot. See text for discussion. Temperature effects on growth of transplanted mouse tail vertebrae. A Kidney with transplanted tail vertebrae from young mice that had been growing for 3 weeks in the warmer abdominal cavity. Effects of incubation temperature on metatarsal growth in vitro. Cold significantly impaired metatarsal elongation. The warm metatarsal had clearly grown more in relative width than it had in length. Sample size N listed in graph. The similarity between the control and warm groups stresses again that there is limited information that can be obtained from a static histological analysis of a postmortem growth plate [A and B adapted, with permission, from Serrat et al. Vessels were visualized using a multiphoton microscope at nm illumination after an intravenous injection of the small Da tracer fluorescein. Plasma is fluorescent yellow and blood cells appear as dark shadows within the vessels. SHG allows collagenous structures to be identified without injecting stains or dyes. The growth plate is oriented as in Figure 2. Images were captured 30 min apart at the same growth plate depth and location, verified in a series of optical sections imaged superficial to deep. Vessels were visualized on a multiphoton microscope at nm illumination after an IV injection of fluorescein. Plasma is fluorescent white and blood cells appear as dark shadows within the vessels. Vessels were notably enlarged after switching to the warmer temperature arrows , indicating the sensitivity of the microvasculature to sensing and responding to temperature change [original text and image, with permission, from Serrat et al. Oxytetracycline OTC label green pseudocolor of epiphyseal top and metaphyseal bottom bone facilitates localization of the growth plate, which appears between the white arrowheads in the far left frame. Boxes depict sample regions for quantifying fluorescence in reserve r , proliferative p , transitional t , and hypertrophic h subdivisions of the growth plate, as well as in the vasculature v of the metaphyseal bone. While the conventional terminology used in Figure 2 is upheld for simplicity, these sample regions were not strictly confined to the standard growth plate zones and boxes may have included cells from adjacent morphological territories [original text and image, with permission, from Serrat et al. Mean values in the warm were nearly double those measured at cool temperature, clearly demonstrating that warm temperature increases solute delivery into the growth plate in vivo. This dynamic process is relevant for understanding how temperature modulates bone elongation.

These differences could not be detected using other methods such as the static histology shown in Figures 9 and 11 [original text and image, with permission, from Serrat et al. Regions correspond to boxes shown in Figure In the cold, fluorescein is distributed nearly equally among growth plate compartments, with slightly more in the transition These results suggest that the cool temperature inhibited solute transport out of the vasculature, allowing less fluorescein to enter the growth plate matrix [original text and image, with permission, from Serrat et al. A novel mechanism of body mass regulation. J Exp Biol Dynamic loading of immature epiphyseal cartilage pumps nutrients out of vascular canals. The effects of changes in the environmental temperature on the growth of bones in the mouse: Radiological and morphological study. Br J Exp Pathol The effects of changes in the environmental temperature on the growth of the tail bones in the mouse. The effects of environmental temperature on the body temperature and ear morphology of the mouse. J Thermal Biol Quantitative genetics of extremity length in the common frog along a latitudinal gradient. J Evol Biol The influence of physical conditions in the genesis of species. Ando J , Yamamoto K. Flow detection and calcium signaling in vascular endothelial cells. Microspheres accurately predict regional bone blood flow. Ang C , Dawes J. The effects of hyperthermia on human endothelial monolayers: Modulation of thrombotic potential and permeability. Blood Coagul Fibrinolysis 5: Temperature, growth rate, and body size in ectotherms: Fitting pieces of a life history puzzle. Integr Comp Biol

Chapter 9 : calendrierdelascience.com: Sitemap

Behrisch HW, Smullin DH, Morse GA, Musacchia XJ, Jansky L. Life at low and changing temperatures: Molecular aspects. The effects of prolonged exposure to.

Note the relatively long duration of entry into torpor more than 24 h and the relatively short duration of arousal from torpor less than 5 h. Note seasonal variations in duration and depth of torpor. Note that the amplitude of F1max is always higher in the hibernating group at all tested temperatures. Samples were taken every 15 min. Dashed line indicates buffer value of extracellular fluid. E denotes data from euthermic animals. Same parameters as those from the left panel, but the squirrels were sacrificed during hibernation. A critical role of membranes in hibernation. Living in the Cold, edited by H. Membrane function in mammalian hibernation. Reproductive development in hibernating ground squirrels. Natural Torpidity and Thermogenesis, edited by L. Academic Press, , p. Life at low and changing temperatures: Survival in the Cold, edited by X. Seasonal variations in the rate and capacity of cardiac SR calcium accumulation in a hibernating species. Temperature dependence of rotational dynamics of protein and lipid in sarcoplasmic reticulum membrane. Enzymes of the normothermic and hibernating bat, Myotis lucifugus: Mechanisms of glycolytic control during hibernation in the ground squirrel Spermophilus lateralis. Reversible inhibition of electron transfer in ubiquinol cytochrome c reductase segment of the mitochondrial respiratory chain in hibernating ground squirrels. Insulin binding and glucose oxidation in edible dormouse Glis glis adipose tissue: Insulin secretion in the hibernating edible dormouse Glis glis: Dissociation of inotropic and toxic effects of the semisynthetic cardiac glycoside actodigin during hibernation in the ground squirrel. Changes in the fluidity of myocardial membranes during hibernation: The adaptation of membrane structure and lipid composition to cold. Circulation, Respiration and Metabolism, edited by R. Warming up for sleep? Persistence of circannual rhythms in ground squirrels with lesions of the suprachiasmatic nuclei. Influence of photoperiod and gonadal steroids on hibernation in the European hamster. Strategies in the Cold: Hibernation induced in ground squirrels by blood transfusion. Regulation of the skeletal muscle metabolism during hibernation of Jaculus orientalis. Kinetics of the sodium pump in red cells of different temperature sensitivity. Inhibition of succinate oxidation and potassium transport in mitochondria during hibernation. Regulation of energy stores in arctic ground squirrels: Melatonin profile in marmots: The influence of catecholamines, hibernation, and light. Seasonal variations in pancreatic function in marmots: Pancreatic alpha and beta cell stimulation in euthermic and hibernating marmots, Marmota flaviventris: Plasma melatonin concentration in hibernating marmots: Plasma melatonin rhythms in euthermic marmot Marmota flaviventris. Carbohydrate and lipid utilization in hibernator. Living in the Cold II, edited by A. John Libbey Eurotext, , p. Gluconeogenesis in arctic ground squirrels between periods of hibernation. Hepatic gluconeogenesis and mitochondrial function during hibernation. The relationship between body mass and rate of rewarming from hibernation and daily torpor in mammals. Effects of photoperiod on hibernation in castrated Turkish hamster. Photoperiod, reproductive hormones, and winter torpor in three hamster species. Differential effects of temperature on three components of passive permeability to potassium in rodent red cells. Effect of gonadal steroid hormones on hibernation in the Turkish hamster Mesocricetus brandti. Phosphofructokinase of the hibernator Citellus beecheyi: Neural mechanisms controlling hibernation. Glucagon secretion in the hibernating edible dormouse Glis glis. Plasma glucose and glucagon concentrations in the hibernating hedgehog. Regulation of brown fat thermogenesis in hibernators. Torpidity in mammals, In: Comparative Physiology of Thermoregulation, vol. Pineal, gonads and hibernation. Pineal Research Review, vol. Neurochemical studies of hibernation. Research and Clinical Application, edited by P. Temperature effects on the Na and Ca currents in rat and hedgehog ventricular muscle. Effects of low temperature on contraction in papillary muscles from rabbit, rat, and hedgehog. Hibernation and Torpor in Mammalians and Birds, edited by C. Physiology and Biochemistry, edited by E. Pergamon Press, , p. Changes in blood sugar and tissue glycogen in the hamster during arousal from

hibernation. Is brown fat necessary?. Hibernation and Torpor in Mammals and Birds. Temperature regulation in the mouse, Peromyscus leucopus: Effect on blood gases and pH in rats and ground squirrels. Further studies of lipid thermotropic phase behavior in liver inner mitochondrial membranes of hibernating ground squirrels. Brown adipose tissue lipid is the main source of energy during arousal of the golden hamster Mesocricetus auratus. Hibernation and Torpor in Mammals and Birds, edited by C. GDP binding to brown adipose tissue mitochondria. Increased GDP binding and thermogenic activity in brown adipose tissue mitochondria during arousal of the hibernating garden dormouse Eliomys quercinus L. Insulin and central regulation of spontaneous fattening and weight loss. Altered properties of calsequestrin and the ryanodine receptor in the cardiac sarcoplasmic reticulum of hibernating mammals. Control of breathing in hibernating ground squirrels. Hormonal control of lipolysis from the white adipose tissue of hibernating jerboa Jaculus orientalis. The regulation of carbohydrate metabolism in hibernators. Preferential utilization of brown adipose tissue lipids during arousal from hibernation in hamsters. Further studies on opioids and hibernation: Characterization of a hibernation induction trigger. Seasonal changes in mitochondrial succinate dehydrogenase activity in a hibernator, Spermophilus richardsonii. Accelerated gluconeogenic processes in the ground squirrel Citellus citellus during the arousal from hibernation. Photoperiod, pineal gland, vasopressinergic innervation and timing of hibernation. Differences in the thermal behavior of myocardial membranes relative to hibernation. The pineal complex and thermoregulation. Rhythmicity of body temperature and torpor in the Djungarian hamster, Phodopus sungorus. Effects of pinealectomy, melatonin injections and melatonin antibody production on the mean duration of individual hibernation bouts of Spermophilus tridecemlineatus. Suppression of metabolism during hibernation in ground squirrels Citellus lateralis. Evidence for the involvement of pineal melatonin in the control of hibernation cycle in Spermophilus lateralis. Metabolic rate depression and biochemical adaptation in anaerobiosis hibernation and aestivation. Radioglucose utilization by active, hibernating, and arousing ground squirrels. Are ground squirrels sleep deprived during hibernation? Pineal melatonin in hibernating and aroused golden hamsters Mesocricetus auratus. Arrest of the circadian pacemaker driving the pineal melatonin rhythm in hibernating golden hamsters, Mesocricetus auratus.