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THE FUTURE OF BRAIN REPAIR

by Hannah Hoag

Neurogenesis occurs in the adult mammalian brain. A couple of years ago, results that supported that statement were published and shook the foundations of neuroscience¹. But what of those neurons; do they have any functional abilities? If medicine is going to consider repairing brains, this is a question that must be answered.

Until the rejection of the no-neurogenesis dogma, the effects of age on memory were considered to be due to the progressive loss of neurons in the hippocampus, the part of the mammalian forebrain that interacts with the cerebral cortex to determine emotions and to

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A SPECIAL GATHERING WILL BE HELD AT THE MCSA ON THE FOLLOWING THEME:

Ageing Research at McGill in the 21st Century

February 12, 2002
Douglas Hall
William E. Stavert Amphitheatre
Douglas Hospital

8:30 a.m. - 12:00 p.m.
Lunch will follow

R.S.V.P. before February 1, 2002 to
Mrs. F. Bard at (514) 766-1009

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MAKING SCIENCE DIGESTIBLE

An interview with Dr. Joe Schwarcz, Director of the McGill Office for Chemistry and Society

by Jeff Boyczuk

A rope trick with a "magic" chemical may have determined Joe Schwarcz's future. A birthday-party magician used the mysterious chemical to bind three separate ropes into one seamless piece. Schwarcz, who even at 10 years of age possessed the trademark skepticism of a scientist, didn't buy any of it. Nevertheless, he was struck by the connection that people readily made between magic and chemistry. A trip to the library ensued, where the young Schwarcz checked out books on both topics. While magic quickly turned into a hobby, chemistry became his life's passion.

Schwarcz's formal plunge into the world of science began with an education at McGill, where in 1969 he completed a B.Sc. in chemistry, and in 1973 a Ph.D. in organic chemistry under the direction of Arthur Perlin. While his doctoral research focused on carbohydrate chemistry, Schwarcz believes that it's the intangible aspects of the graduate student experience that prepares one for a career in the sciences. "You learn how researchers think. You learn about the publication process. You learn about the intrigue, the personal clashes, and everything that is involved in the humanity of science".



Maybe more importantly, it was what Schwarcz didn't learn in his formal studies that set his career path. As a student, he often wondered why there were not more links made between chemistry and daily life. "It always frustrated me that I had gone through undergraduate and graduate studies, and I knew how to solve quantum mechanical equations, but basically knew nothing about chemistry that mattered. I didn't know anything about drugs, or cosmetics and foods because there was never any emphasis placed on those everyday things".

Schwarcz has attempted to rectify this in his own teaching career. At McGill, he has collaborated with colleagues David Harpp and Ariel Fenster to design and teach the

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PUBLIC LECTURE SERIES

Parkinson's Disease: Who is at Risk and How to Cope

by Alison McTavish

Parkinson's disease was the topic for a recent McGill Centre for Studies in Aging public lecture. Dr. Michel Panisset, Director of the Movement Disorders Clinic at the Centre for Studies in Aging, explained Parkinson's disease to the large audience at the Montreal Delta Hotel. (See Geronto-McGill's profile of Dr. Panisset in

the March 2001 issue). Joining Dr. Panisset on the panel were Ms. Marie-Josée Fortin and Ms. France Faubert. Ms. Fortin is the Research Coordinator at the Movement Disorders Clinic, while Ms. Faubert was recently diagnosed with Parkinson's disease.

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THE FUTURE OF BRAIN REPAIR

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process memories. With the newly found knowledge that the brain neurons of the adult mammal could divide, came new theories about aging, disease and memory impairment. The ability to form new memories is now thought to be closely linked to the generation of new hippocampal neurons, a process which is thought to slow with age.

Shors and colleagues² recently showed that the reduction of hippocampal neurogenesis impairs certain hippocampal-dependent memory tasks. Their results suggest that neurogenesis – not just an absolute number of neurons – is essential to the formation of certain memories.

While adding neurons to an aging, but otherwise healthy, brain may seem far-fetched, neuron replacement might help those who suffer from neurodegenerative diseases affecting the hippocampus, such as Alzheimer's disease and strokes, where mature, functional neurons are killed.

1. P.S. Eriksson, E. Perfilieva, T. Bjork-Eriksson, A.M. Alborn, C. Nordborg, D.A. Peterson, and F.H. Gage. "Neurogenesis in the adult human hippocampus," *Nature Medicine*, 4:1313-7, November 1998.
2. Tracey J. Shors, George Miesegaes, Anna Beylin, Mingrui Zhao, Tracy Rydel, and Elizabeth Gould. "Neurogenesis in the adult is involved in the formation of trace memories," *Nature*, 410: 371-5, March 2001.

An interview with Dr. Joe Schwarcz, Director of the McGill Office for Chemistry and Society

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"World of Chemistry" courses. These highly popular courses, which are open to science and non-science students alike, combine basic chemistry principles with tantalizing anecdotes and real-world applications, bridging the gap between the technical and the practical.

But his efforts at making chemistry more accessible have gone far beyond the university lecture hall. Today, Schwarcz is arguably the most popular and recognizable chemist in Montreal, with a weekly radio show on CJAD, a Sunday column in *Le Devoir*, and regular appearances on the Discovery Channel. Through all of these outlets he makes the public aware of the myriad of scientific choices they must make on a daily basis. From the breakfast cereal you buy, to the shampoo you use, to the motor oil you put in your car, the science of chemistry affects us all. And if you have a nagging question that Schwarcz doesn't get to through these media efforts, there is now an office at McGill that just may have the answer.

In 1999, Schwarcz, Harpp, and Fenster opened the McGill Office for Chemistry and Society (MOCS). The office serves as a chemistry-related information centre for public and media inquiries. Schwarcz, who acts as director of the MOCS, personally responds to more than 20 email and phone inquiries per day, underlining the public demand for reliable scientific information. The office may be particularly useful for seniors, says Schwarcz, noting that they are faced with many important questions about medications and other health-related chemistry issues. "Alternative" health products, which today are big business, may be of particular interest to older individuals.

A case in point is a drug that has been described as the "magic bullet" for arthritis sufferers, methylsulfonylmethane, or MSM for short. While testimonials from celebrities such as actor James Coburn have promoted MSM as a miracle drug, Schwarcz notes that the bulk of the evidence for its effectiveness in treating arthritic symptoms remains anecdotal, since few rigorous scientific studies have been carried out. Nevertheless, Schwarcz sympathizes with arthritis sufferers who put hope in the

grandiose claims of MSM manufacturers. "It's a chronic disease, there are no cures, and there are no great drugs to offer either. The standard drugs that are used have pretty significant side effects. So people are always looking for something that has a better safety profile."

A condition that is not physically devastating like arthritis, but that many find psychologically difficult as they age, is hair loss. Schwarcz, who happens to have taught a course to hairdressers entitled "Chemistry of Hair", notes that there are two drugs on the market for hair growth. One, marketed under the name of Propecia, is an oral medication. The other, Rogaine, is applied topically to the head. There is good scientific evidence that both grow hair, says Schwarcz. However, he cautions that the "statistically significant" growth touted by manufacturers does not necessarily translate to a flowing head of hair for users. "There's a difference between taking a magnifying glass and measuring peach fuzz on someone's head, and seeing luxurious hair growth." While some users do garner noticeable results, Schwarcz suggests that these treatments work more effectively in retaining hair that is already present, rather than stimulating re-growth.

The MOCS is also frequently consulted about herbal remedies and dietary supplements. Schwarcz is particularly well-versed in this area, having acted as a consultant and contributor to the Reader's Digest books "Foods that Harm, Foods that Heal" (1997) and "The Healing Power of Vitamins, Minerals and Herbs" (1999).

The allure of many of these products comes from a long tradition of use, says Schwarcz, who cites ginseng as an example. The Chinese have consumed this root for thousands of years, as a remedy for disease, both physical and mental, as well as to prolong life. Unfortunately, there is woefully little evidence of its effectiveness as health product. Part of the problem with ginseng, and herbal remedies in general, is that they are not patentable substances, and therefore drug companies are not willing to make large investments in researching their effectiveness, says Schwarcz.

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Untreated Asthma in the Elderly

by Alison McTavish

Asthma is a disease in which the airways of the lungs become inflamed and react to irritants like dust, pollen and smoke. The inflamed airways become very narrow, making it hard for patients to breathe. As a result, sufferers start wheezing, coughing, and complain of shortness of breath and tightness in their chest.

A recent study published in the *Journal of Allergy and Clinical Immunology* found that many adults over the age of 65 years who have asthma are underdiagnosed and undertreated. The authors studied 80 adults with asthma and determined the severity of their disease by checking symptoms and measuring lung function. They also collected dust samples from the study participants' homes.

Two thirds of the participants were found to have moderate or severe persistent asthma that was typically caused by indoor irritants such as dust mites or mold, and allergens from cockroaches, cats and dogs. The high levels of allergens found in the homes of older adults resulted from carpeting, older furnishings, high indoor relative humidities and non-encased mattresses.

Despite the high allergy levels the investigators found among the elderly, few were taking the correct medication. One third of the elderly in the study were not taking inhaled steroids, the preferred asthma treatment. Instead, many were regularly using short-acting inhalants, medications that should only be used on an as-needed basis.

The study also indicated that asthma in the elderly contributes to a decreased quality of life. Those with more severe asthma reported more negative feelings about life in general, described their health as being poor, and had a greater degree of impairment during daily activities. Because of this, some older adults with severe asthma may be less able to perform domestic chores such as dusting and vacuuming, leading to higher allergen levels and the exacerbation of their asthma.

The authors conclude that elderly patients with asthma should be given skin tests to identify allergens. When identified, these allergens could then be reduced in the home. Along with proper use of medication, these measures could lead to a better quality of life for asthma sufferers.

Reference

Huss K et al. Asthma severity, atopic status, allergen exposure and quality of life in elderly persons. *Ann Allergy Asthma Immunol* 2001 May;86(5):524-530.

POLICY AND POLITICS

Vancomycin-Resistant Enterococci and Seniors: Implications When Applying to Retirement Residences

by Julie Comber

Since 1989 there has been a rapid increase in the incidence of infection and colonization with vancomycin-resistant Enterococci (VRE). (1) Enterococci are normal inhabitants of the human gastrointestinal and female genital tract. Many people colonized with Enterococci, even VRE, can be completely asymptomatic. However, in elderly or immunocompromised patients, Enterococci can become opportunistic. Enterococci can cause infections in the urinary tract, skin and soft tissues, as well as intra-abdominal and neonatal infections. It can also cause otitis media, and even more alarming, endocarditis and bacteremia (sepsis). If the Enterococci causing the infection turn out to be vancomycin-resistant, it is very serious indeed. VRE are not only resistant to vancomycin, the "antibiotic of last resort" for Gram-positive infections, but also to other currently available antibiotics. This severely limits therapeutic options.

Historically, the source of enterococcal infections was believed to be the patient's own flora. However, recent studies have shown that VRE and other Enterococci can be transferred through direct contact between patients or indirectly on the hands of personnel or through contaminated environmental surfaces and patient-care equipment. (1) Besides the gastrointestinal and female tract, other sites of colonization may act as reservoirs for Enterococci in hospital patients and in seniors in retirement residences, including wounds and chronic pressure sores and on the perineal or meatal areas of men. Enterococci are not spread via respiratory droplets.

VRE are not only considered a serious threat because VRE infections are difficult to treat, but also because it is feared the vancomycin-resistant genes present in VRE could be transferred to other gram-positive bacteria, such as ubiquitous *Staphylococcus aureus*. (1) Therefore, preventing VRE infections and colonizations are important in hospitals and in retirement residences. The Centers for Disease Control (CDC) has published "Recommendations for preventing the spread of vancomycin resistances". (1)

The report recommended that a plan should be developed regarding the discharge of VRE infected or colonized patients to other hospitals, home care, or to retirement residences. However, as noted above, a person can be infected or colonized with VRE indefinitely. What does this mean for a senior with VRE who is seeking admission to a retirement residence?

One study in Vancouver found that seniors with VRE had to wait significantly longer before finding a long-term care placement facility than controls – two months longer. (2) And they submitted an average of 2.5 requests for admission, while controls submitted 1.7. (2) To assess the situation here in Montreal, retirement

residences were selected at random from the phone book. In all, 8 residences were contacted. It became clear that in Montreal, VRE has not yet become a problem for retirement residences; in fact, many of the residences were unfamiliar with VRE altogether. However, once they understood that it was a type of antibiotic-resistant bacteria, they were able to answer questions.

None of the retirement homes interviewed reported ever having had a senior apply who was VRE positive. Although no residences reported a specific policy concerning seniors with VRE, all of them reported varying degrees of concern and hesitation about accepting seniors with VRE. For most residences, this was due to concern of a possible outbreak in the residence, which they thought was an unacceptable risk to current residents. The residences were also asked what would happen if a resident went to hospital, contracted VRE and wished to return to the residence. This had not occurred in any of the residences. One doctor stated that in the event that this did occur, they would want confirmation that the patient was clear for VRE before he or she returned to the residence. If the patient was not clear, then the doctor said they would contact the Infectious Disease Department at the hospital to find out if the residence's personnel would be able to prevent an outbreak. If they did not think they could meet the requirements, they would try to find another residence for the patient. Only one residence said they would re-admit a resident who contracted VRE in hospital without hesitation (although they would be very concerned about accepting a new senior with VRE). They said they would simply have personnel wear gloves when working with the senior with VRE. However, according to CDC guidelines this alone would not be adequate to contain VRE.

All in all, having VRE could be a serious obstacle for a senior seeking admission to a retirement residence in Montreal, consistent with results from the study in Vancouver. This is further compounded by a lack of solid policies concerning VRE in retirement residences and the lack of general knowledge about VRE. A help line for seniors was contacted, and none of the personnel on call that day had ever heard of VRE. One of the great hopes, then, for seniors and other people with VRE is that better treatments will become available. Fortunately, there has been some success with quinupristin-dalfopristin (marketed as Synercid, and now available in Canada) and linezolid therapy (3), as well as with chloramphenicol. (4) With luck, these therapies will remove VRE as an obstacle to seniors when applying to retirement residences.

References

1. CDC: Recommendations for Preventing the Spread of Vancomycin Resistance. *MMWR* 1995; 44: RR-12.

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PUBLIC LECTURE SERIES

Parkinson's Disease: Who is at Risk and How to Cope

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Who is at risk?

Dr. Panisset opened his talk by explaining the primary signs of Parkinson's disease: a decrease in spontaneity and movement (bradykinesia), tremors, rigidity and difficulty with balance. These symptoms result from the death of brain cells that make dopamine, a neurotransmitter that allows brain cells to transmit messages. At the moment, these symptoms are the only way of diagnosing the disease. When patients complain of these symptoms, their doctors will typically perform a number of tests including blood tests and neurological scans. However, these tests are done to eliminate other possible causes of the symptoms because a definitive diagnostic test for Parkinson's has not yet been developed.

Dr. Panisset asked the audience how many knew someone with Parkinson's disease. Parkinson's, he pointed out, is one of the most common neurodegenerative diseases with at least 100,000 patients in Canada, and at least one million in the United States. Although many sources suggest that 1% of the population over the age of 50 have the disease, this probably is an underestimation of the true prevalence.

Who is most at risk for developing Parkinson's? It turns out that this is a difficult question that has been examined in many epidemiological studies. Although it is clear that the disease is more prevalent among older adults, it also occurs in people in their thirties and forties. There also appear to be some demographic factors, with slightly higher rates in Western countries.

A number of studies have examined risk factors for the disease. A possible role for environmental pollutants such as manganese, iron and aluminum has not been found. However, a link has been found between Parkinson's disease and the use of pesticides. Unfortunately, there are many pesticides in use today, and researchers have so far been unable to narrow the field down to isolate a specific pesticide.

About 20% of patients have some family history of Parkinson's, suggesting that there could be a genetic component. However, there is no difference in the rates of the disease in identical and fraternal

twins. Because identical twins have the same genes, both should suffer from the same diseases if they are genetic in origin. If one identical twin develops Parkinson's and the other does not, this suggests that an environmental component must also be involved. It seems likely that the disease results from a combination of genetic and environmental factors.

There are, however, some unique patients that may help researchers find some new clues to this disease. According to Dr. Panisset, six families in the world are known to have a rare gene that passes Parkinson's disease from parent to child. The gene is found on chromosome 4, and it encodes a protein called alpha-synuclein. By studying this protein, researchers hope to better understand the way the disease develops in all patients.

Dr. Panisset ended his presentation with an overview of the treatments currently available. Most treatments, such as bromocriptine, are aimed at replacing the lost dopamine in the brain. Newer therapies include implanting an electrode into the brain that can control tremors, and the transplant of dopamine-producing cells. Results from these new treatments have been encouraging, and research is continuing.

Coping with Parkinson's

The second speaker of the day was Marie-Josée Fortin, Research Coordinator at the Movement Disorders Clinic. Ms. Fortin introduced France Faubert, one of the estimated 25,000 Quebecers that have been diagnosed with Parkinson's disease. Ms. Faubert was diagnosed with the disease at the relatively young age of 46. She admitted that the disease was difficult to cope with at first because she was a very active and independent person.

Ms. Fortin pointed out the difficulty patients often have in accepting a Parkinson's diagnosis. New patients typically become afraid and anxious about the future and a possible loss of control over their body. This can often lead to feelings of hopelessness and depression. However, Ms. Faubert told the audience that she had not

become depressed. She tries to lead an active life as much as possible including working, playing sports and even playing the violin. She admitted that the most frustrating aspect of the disease for her was the feeling of tiredness and lack of energy, which have slowed her down since her diagnosis.

Ms. Faubert stressed to the audience that she remains very hopeful about her condition, and feels she can help others by talking about coping with the disease. When asked by a member of the audience what gave her the most hope, she replied "Dr. Panisset." For Ms. Faubert the best way to cope with the disease is to live as normal a life as possible and to offer her support to research efforts at the Movement Disorders Clinic.

Resources

Société Parkinson du Québec
1253 McGill College, Suite 402
Montreal, QC H3B 2Y5
Phone: (514) 861-4422
Toll free: (800) 720-1307
Fax: (514) 861-4510

Taking Charge: A guide to living with Parkinsonism is available from http://www.parkinson.ca/pdf/e_takingcharge.pdf

An interview with Dr. Joe Schwarcz, Director of the McGill Office for Chemistry and Society

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Although the health benefits of natural supplements tend to be over-hyped, Schwarcz does point to some new products that look promising, but need more investigation. Coenzyme Q10 (CoQ10) is one example. As one of the molecules that facilitates chemical reactions necessary for muscle movement and heart function, CoQ10 was once touted as a cure-all by supplement manufacturers. While these initial claims were overblown, more than one study has demonstrated significant improvements in heart patients receiving CoQ10 in addition to their regular treatments. Schwarcz notes that many physicians are not aware of CoQ10's benefits, likely due to a skepticism bred by the typical hype coming from supplement manufacturers. "Unfortunately sometimes the scientific community will discard it

because of the context, because it is sold in health food stores. But what you really have to do is look at the research".

Considering his long hours at the MOCS, his teaching duties, and several media commitments, you might assume that Schwarcz doesn't have much time for new projects. Think again. The ever-busy scientist has recently parlayed his interest in the chemistry of nutrition into his own line of pre-prepared vegetarian meals. The motto for the line, which will hit grocery stores in the coming months, is "inspired by science, dedicated to health, and committed to taste". And speaking about food, watch for his new show "Science to Go" on the Canadian Discovery Channel in Feb 2002. Each episode will focus on the chemistry of one food (chocolate and wine will be two shows in the first season), but in a fun and

entertaining way, says Schwarcz.

And making it entertaining has always been an important element in Schwarcz's efforts to bring the "chemistry of life" to the public. So even if you couldn't digest chemistry in high school, keeping watching for this magician of the scientific world. "Dr. Joe" just may have the right pill for you.

Joe Schwarcz is Director of the McGill Office for Chemistry and Society. The office responds to public and media inquiries regarding issues related to chemistry and can be reached by phone at (514) 398-6238 or by email at chempublic@mcgill.ca. The MOCS web site address is <http://ww2.mcgill.ca/chempublic/>

Cardiac Mortality Connected to Depression

by Jeff Boyczuk

If seeking happiness for its own sake doesn't seem like a worthy enough pursuit, a recent study linking depression to increased rates of heart-related death may provide some additional motivation. This finding comes from a study by Brenda Pennix and colleagues appearing in the March 2001 *Journal of the American Medical Association*.

It has been known for some time that for cardiac patients, major depression significantly increases the chance of dying from heart-related causes. Now it appears that even depressed individuals who have no history of cardiovascular disease may also be more susceptible to heart deaths. Depression has been previously linked to negative physiological effects on the cardiovascular system, such as high blood pressure. Poor eating habits, lack of exercise, and other unhealthy lifestyle traits that are common among the depressed may also play a role in increasing cardiac mortality rates.

Pennix and her colleagues examined the medical records of a group of 2,847 men and women from the Netherlands, aged 55-85. From this sample, 450 had a confirmed diagnosis of cardiac disease. Diagnostic tests revealed major depression

in 1.8 % of the no-cardiac-disease participants, and in 2.4 % of the cardiac patients. Minor depression was found in 12 % of the non-patients, and in 17.8 % of the patients.

Over a five-year follow-up, 501 subjects died, with 36.7 % of these deaths being attributable to heart failure. When compared to their non-depressed counterparts, subjects with major depression were three times as likely to have had a heart fatality. The risk for those with minor depression was 1.6 times greater. This increased risk was approximately the same among cardiac patients and non-patients.

Pennix, B., Beekman, A., Honig, A., Deeg, D., Schoevers, R., van Eijk, J., Tilburg, W. (2001). Depression and cardiac mortality. *Archives of Geriatric Psychiatry*, vol 58, pp. 221-227.

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- Bryce EA, Tiffin SM, Isaac-Renton JL, Wright CJ: Evidence of delays in transferring patients with methicillin-resistant *Staphylococcus aureus* or vancomycin-resistant *Enterococcus* to long-term-care facilities. *Infect Control Hosp Epidemiol* 2000; 21: 270-271.
- Summers M, Misenhimer GR, Antony SJ: Vancomycin-resistant *Enterococcus faecium* osteomyelitis: successful treatment with quinupristin-dalfopristin. *South Med J* 2001; 94: 353-355.
- Ricaurte JC, Boucher HW, Turett GS, Moellering RC, Labombardi VJ, Kislak JW: Chloramphenicol treatment for vancomycin-resistant *Enterococcus faecium* bacteremia. *Clin Microbiol Infect* 2001; 7: 17-21.

See also information on the following websites:

<http://www.cinetwork.com/otero/vre.html>
<http://www.cdc.gov/ncidod/diseases/hip/vancomyc.htm>
<http://www.pslgroup.com/dg/18EE4E.htm>

REGISTRY OF AGING-RELATED WEBSITES

by Hannah Hoag

geriatrics

The American Physical Therapy Association section on Geriatrics. The APTA has designed a website stocked with information for members of the APTA and for their patients. Members can access current news, read about special interest groups, or find out about upcoming meetings and courses. Patients can learn more about the role of physical therapy for the elderly and access a number of exercises designed with the elderly body in mind.

geriatrics education

This simple website provides physicians with access to 13 different topics in geriatrics ranging from cardiology to urinary incontinence. Further information about patients, education, and research can be accessed through this page.

geriatrics resource guide

The Beuhler Center on Aging at the McGraw Medical Center of Northwestern University has established a geriatrics resource guide for physicians. The table of contents is extensive. Some of the topics include how to perform a medical history and physical examination of an elderly patient, abuse and neglect of the elderly, and dizziness in the elderly.

geriatrics group

If you're looking for recently published articles related to geriatrics, check here first. Each entry supplies the title to a recently published news story.

gerontology education

The Andrus Gerontology Library of the University of Southern California hosts a website that contains a list of web resources for the researcher, student, or physician interested in aging and its related topics.

gerontology journals

Links to nearly 80 geriatrics and gerontology journals from around the world can be found on this webpage. Should you be interested in other journals, less aging specific, there are 17,000 other links you can access through Sciencekomm.

gerontology journals



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