



DAVID SAUL: Tracing the evolutionary history.

Finding the root of the tree of life

by Marcus Stickley

Microbiologist David Saul and his team are working to unearth the root of the tree of life.

"We are trying to get some reasonable evidence about the ancestors of living organisms, the last common ancestor of everything that is alive to today," says Saul.

By tracing the evolutionary history of housekeeping genes, which are found in all living organisms, Saul is hoping to reach LUCA, the last universal common ancestor.

"When you look at that DNA and protein sequences in a gene from as far apart as bacteria to animals and plants then you find that there is still a lot of similarity," he says.

Saul compares the level of similarity of a gene between living organisms and their ancestors tracing the evolution of that gene to the organism it diverged from.

"From looking at the leaves on a tree we can predict what the

branching pattern is," he says.

The University of Auckland scientist predicts that life evolved from LUCA around 3.5 billion years ago.

His most recent project recreated a gene that is predicted to have diverged 200 to 300 million years ago.

Developed at the university, the gene was placed in *Escherichia coli* bacteria and predictions about its original organism were made based on the enzyme produced.

Saul's findings support the idea that life emerged in an environment where temperatures may have reached 120 deg C.

This is thought to have occurred up to 3.8 billion years ago.

"In theory you can predict all the way down to the last common ancestor but in practice it might take a lot of attempts and a lot of money," says Saul.

His team is currently making three new genes and hopes to trace their evolution back as far as 1 billion years.

Breast cancer education needed for young women

by Kiely Groombridge

Breast cancer came as a shock to a 23-year-old Remuera woman. The disease is rare for anyone under the age of 50, especially when there is no family history.

"I didn't believe it for the first few weeks. It's one of those things you never ever imagine happening to you," says Victoria (not her real name).

She endured chemotherapy, radiation and a mastectomy to remove a cancerous lump. At 23, Victoria was too young to be eligible for free screening checks.

"I don't think it could have been prevented. I was just unlucky."

The National Breast Screening Unit, an arm of the Ministry of Health, provides a free mammogram service for older women every two years. However, public pressure to lower the age is growing.

Last July the Government expanded the public-funded screening checks to include women aged between 45 and 69 years. Previously, women aged 50 to 65 were eligible. It is within this age bracket that more than 80% of cancer deaths occur.

However, Jenny Richards, spokesperson for the breast screening unit, is worried that lobbying to further lower the age of free screening is obscuring the real issue for New Zealand women.

"Of course it's tragic when a young person is affected. It's a huge tragedy, but we need to concentrate on the women most likely to suffer the greatest."

Currently the Government-funded service is used by only

62% of all eligible women.

"Screening works on a population basis and we have to make sure that a publicly funded programme is benefiting the greatest proportion of at-risk people.

"Research proves the risk of breast cancer increases with age, and although all women need to be aware of breast cancer, screening at a young age can cause unnecessary fear," she says.

Mammograms involve each breast being placed between two plates on the x-ray machine and held firmly for a few seconds while pictures are taken. Tissue changes are thus identified.

This is so far the only proven method of detecting breast cancer.

However, Richards says screening young women under the age of 40 can do more harm than good, because the denser breast tissue raises the possibility of inaccurate results.

"When there's more premenopausal tissue, cancer is much harder to detect. We may see something there that isn't, and come out with a false positive.

"Or worse, we may not pick it up when there is actually something there."

With the positives and negatives of screening young women weighed up, it is unlikely the age will be lowered further.

"There are so many stories about young women getting breast cancer, that it causes false perception and fear," she says.

Amanda Gray, national community educator for the New Zealand Breast Cancer

Foundation, agrees.

"There are more people talking about cancer now and being more open, so it seems cancer is occurring in young people more — but the facts and figures do not back that up," she says.

Gray supports educating young women about breast cancer, but does not want to cause unnecessary worry for those at very low risk.

"I think it's a bit of a double-edged sword," she says.

"We do need to educate young women but on the other hand some women can panic and think they're more at risk than they are."

Gray has endured her own battle with the illness, having been diagnosed at the age of 30, when her baby was 14 months.

She is now focused on educating young girls so they know about cancer, but not in an unrealistic context that creates fear.

"We believe that knowledge is power for any age group, and information backed up with facts shows they have a minor chance of getting it.

"It is something they need to think about, but it shouldn't dominate their life," she says.

A journal put out by the National Cancer Institute says that although mammographic-screening has been proven to reduce breast cancer mortality by about one-third in women older than 50 years of age, a similar effectiveness in younger women has not been demonstrated.

Richards says it is this research that supports the current actions of the screening unit and their age bracket.

New technology set to end expensive phone calls

By Russell Page-Wood

The future of telecommunications in New Zealand is set to revolutionise the way we communicate by phone — as the internet did to letters with email.

The relatively new idea of internet phones has been under development by high-tech companies in Taiwan and the software is becoming readily available in New Zealand.

Softphone Tech Ltd is one of New Zealand's leading internet phone companies and is a branch of Howdy Corporation, based in Taiwan.

In lay terms, the software, which can be downloaded from any major internet download site such as www.download.com, in conjunction with a Howdy Softphone account, enables you to make a phone call anywhere in the world at very competitive rates.

The drawback is that if you call another user on their internet phone anywhere in the world the call is free.

Softphone sales representa-

tive Tommy Fan says that this service will always remain free.

"There is a general rule around the world for IT companies, that IP (internet protocol) to IP is always free," says Fan.

Communication from IP to IP involves two or more computers via the internet. Every computer that connects to the internet is assigned a unique identifying IP number.

Other forms of communication that are widely used, such as email and popular chat programs like MSN Messenger and Yahoo, fall under the category of IP to IP.

One problem at present is only being able to use internet phones from a specific computers with its IP address.

Fan explains that Softphone Tech has already overcome this problem.

"Soon you will be able to take your phone everywhere with you — if you have wireless internet access.

"There are hot spots jumping up all around major cities in the world."

Hotspots are areas where a

company's internet coverage spills out of its building and into the public domain.

"If you have wireless access to the internet you can connect," says Fan.

"Soon the whole world will be one big hot spot. The options will be limitless."

Internet phones are not very prevalent in New Zealand and are mainly used by large businesses to take advantage of cheap and free international toll rates.

The Howdy Softphone range of products may change this however.

Planned is a range of hardware for those not so computer savvy, like a phone that plugs in and looks and works exactly like any other phone, as well as mobile options.

One problem is that the quality of the call depends heavily on internet speed.

Until the rates in New Zealand for faster internet come down, it will be a long time before the internet phone makes an impact on traditional telecommunications companies



INTERNET PHONES: The future is already making an impact.

