

My prog-MS ezine

For people with progressive MS and other interested people

Issue 50, September/October 2023

Hello and welcome to the 50th edition of my ezine about progressive Multiple Sclerosis and MS progression in general. My name is Ian Cook. I'm a secondary progressive MSer from Birmingham, UK. I'm 65.

In this 50th issue, yes, it's eight years after I started in 2015, there are as usual eight pages of prog-MS news stories. There are also two features. One on page 5 is about cows and MS and this one isn't just about milk. There's another feature about how MS can affect your relationships. As a newly single man and a repeated failure at finding success in relationships this is sadly a subject I am well qualified to talk about. See page 10 for further details.

IN THIS ISSUE



Beef and MS – is there 'food for thought?' See page 5

Preventative EBV vaccine could potentially treat MSp2

Vitamin D supplement reduces progressive MS disease in animals, p3

News

Preventative EBV vaccine could potentially treat MS

Researchers are one step closer to developing a preventative vaccine against the Epstein-Barr virus (EBV). It is theoretically possible that vaccinating people who already have MS with a preventative vaccine against EBV may have some effect on their existing MS.

It is also possible that a preventative vaccine may lead to the development of a therapeutic vaccine that might stop the disease from worsening. There are already three cancer therapeutic vaccines which are approved by USA Food and Drug Administration and therapeutic vaccines are being actively researched in HIV soa n EBV vaccine that stops MS worsening is a real possibility.

The MS-EBV link is already well established. A 2022 study from the Harvard T.H. Chan School of Public Health looked at 801 military personnel who developed MS. They found a higher rate of EBV infection in people with MS compared to the control group who did not develop MS. They suspect that the virus could lead to issues like MS by both triggering an autoimmune response in the body or triggering immune dysregulation following infection.

In the latest research published on August 8, 2023 in Nature Communications, researchers from QIMR Berghofer Medical Research Institute in Australia demonstrated that they had designed a vaccine that successfully targets multiple arms of the immune system in mice to block EBV activity and prevent EBV-associated diseases. The vaccine, would lead to the first EBV vaccine licensed for human use.

“The value of a vaccine against Epstein-Barr virus would be primarily against the serious complications that can occur such as lymphoproliferative disease or possibly multiple sclerosis,” said Dr. Amesh Adalja, FIDSA, a senior scholar at the Johns Hopkins University Centre for Health Security and an infectious disease expert.

“EBV is a serious disease caused by the EB virus, and while they can be overcome, the virus stays latent in the body and can become active again when an individual’s immune system is weakened,” says Suellen Hopfer, MS, PhD, of the University of California Irvine. “The fact that a person never clears Epstein-Barr virus is what makes it challenging,” Adalja said.

By stimulating antibodies and T cells, the vaccine is able to teach our body to wipe out primary infections and continue monitoring and clearing infected cells over time. The vaccine was injected into the lymph nodes of mice, the centre of the body’s immune system. The team found that it produced strong immune responses against primary and latency infections. The researchers hope to launch human clinical trials in 2024 or 2025 .
For details of sources for all news stories go to page 14

Vitamin D supplement reduces prog-MS like disease in animals

Vitamin D reduced signs of inflammation and nerve damage in a rat model of progressive multiple sclerosis (MS), a study shows,

Low levels of the vitamin have been extensively linked with a higher risk of developing relapsing forms of the disease, but studies of vitamin D supplementation in MS patients have yielded conflicting results. Recent data suggest it may help prevent disease progression in progressive forms of MS.

The study, "Vitamin D — An Effective Antioxidant in an Animal Model of Progressive Multiple Sclerosis," was published in Nutrients. Vitamin D deficiency is thought to be a risk factor for neurodegenerative diseases, including MS. In several studies, however, vitamin D, even at high doses, failed to reduce relapse rates with relapsing-remitting MS. Few studies, however, have investigated vitamin D's impact on the progressive forms of MS, including primary and secondary progressive MS

Scientists at the University of Graz, Austria tested vitamin D in a rat model that mimics many features of progressive MS, including damage to the cerebral cortex, the outer layer of the brain.

Vitamin D-treated rats had less myelin loss in the cortex and significantly reduced activation of microglia, the brain's resident immune cells, than the untreated ones. Reduced cell death and the improved preservation of cortical nerve cells were also associated with vitamin D. Microscopic imaging of cortex tissue showed consistent results, including the preservation of neurofilaments, proteins that give structure to nerve cells.

Blood tests showed elevated levels of neurofilament light chain (NfL), a marker for nerve cell damage, in progressive MS rats over the unaffected control rats. However, the vitamin D-treated animals had significantly lower NfL levels than untreated progressive MS ones, indicating the supplementation limited nerve damage. Markers that indicated remyelination were also increased in the treated animals.

Similar trends were seen with two markers of oxidative stress, a type of cell damage that further activates the immune system. Vitamin D in progressive MS rats significantly increased their ability to neutralize oxidative stress.

"[Vitamin D] seems to have potential as a supplement in progressive MS, which is why much more research on [vitamin D] in progressive MS and associated animal models is required," the researchers said**.**

For details of all news stories go to page 14

Trial results of drug to fight EBV in prog-MS due in November

In November Bio-pharma Atara Biotherapeutics is planning to announce the one-year data from a Phase 1/2 study, which is testing the company's experimental treatment ATA188 for progressive MS.

ATA188 is an experimental therapy that uses immune T-cells to fight off Epstein-Barr virus (EBV) infected immune cells in MS patients. It contains T-cells obtained from healthy donors who have previously been infected with EBV; the cells are, therefore, primed to recognize certain EBV proteins and launch an attack against the infected cells. EBV is a common virus best known for causing infectious mononucleosis, (glandular fever). After the initial infection, the virus can stay dormant inside B-cells, the immune cells responsible for producing antibodies. EBV has been strongly linked with MS for decades.

Atara has been testing its experimental treatment ATA 188 in people with progressive MS in the two-part EMBOLD trial (NCT03283826) since its launch in 2017. Data from the trial's Phase 1 part and its four-year extension portion showed that ATA188 may help patients achieve confirmed disability improvement, or a lessening of disability, defined as a reduction in EDSS scores recorded in at least two consecutive study visits.

Of the trial's initial 24 patients, seven had disability improvements and 13 had maintained stable disability scores over about three years of follow-up. This benefit was maintained over time, with patients who experienced improvements continuing to have them at least after a median of 27.5 months, or more than two years.

In the Phase 2 part, patients were randomly assigned to receive ATA188 or a placebo, given in two treatment cycles, for one year. Then, in the second year, patients in the placebo group also received two cycles of ATA188, while the other group were given one cycle of ATA188 and one cycle of a placebo. After completing the two-year trial, patients may enter an open-label extension and receive ATA188 for up to three more years.

So far, data has come from an initial group of 34 patients observed for at least six months and 15 patients who were followed for at least one year. However, that early data did not provide enough evidence to make definite conclusions about the benefits of ATA188.

In addition to announcing results from the primary outcome measure of confirmed disability improvement, the company anticipates sharing data for patients who have been observed for longer than one year. According to this analysis, patients who experienced confirmed disability improvement with ATA188 had lower accumulation of glial fibrillary acidic protein (GFAP) in blood, a potential biomarker of disease progression in MS.

For further details see page 14.



Beef and MS – food for thought

Dairy has long been considered the environmental factor that causes MS. The reason is simple - MS is far more common in countries where cow's milk is drunk. Recently, Nobel Prize winner and virologist Harald Zur Hausen widened this theory to look at beef and MS too.

Zur Hausen made several interesting observations about the connection between cow products and MS in academic papers published in 2014 and 2021. In the 2014 paper he said: "Epidemiological data point to the involvement of a cow milk factor in the aetiology of multiple sclerosis (MS)." In the 2021 paper he went further, suggesting that MS is associated with the consumption not just of milk but beef too.

He noticed isolated ring-shaped DNA molecules closely related to BMMF (bovine meat and milk factors) from dairy and cattle blood are present in the brain lesions of patients with MS. Zur Hausen was amazed at his findings. As he put it: "The result was electrifying."

Zur Hausen didn't go so far as to say that beef and milk cause MS. Rather he thought MS is caused by a double infection of brain cells by the Epstein Barr virus (EBV) and the presence of BMMF in those EBV infected brain cells.

Zur Hausen is the latest in a long list of researchers to make a connection between MS and cow products although traditionally most researchers have limited their attention to milk rather than beef. In 2018 a German academic Stefanie Kürten from University Hospital Bonn looked into a link between cows' milk and MS. She explains: "We injected mice with different proteins from cows' milk. We wanted to find out if there was a constituent that they were responding to with symptoms of disease."

Kürten and her group did indeed find exactly what they were looking for. When they administered a cows' milk constituent called casein together with an effect enhancer to the mice the mice went on to develop neurological disorders. Electron microscopy showed damage to the insulating layer around the nerve fibres, the myelin sheath.

Continued on page 6

Continued from page 5 The insulating sheath was massively perforated in the mice, apparently triggered by casein administration. "We suspected that the reason was a misdirected immune response, similar to that seen in MS patients," explains Rittika Chunder, a postdoctoral fellow in Prof. Kürten's research group. "The body's defences actually attack the casein, but in the process, they also destroyed proteins involved in the formation of myelin."

Casein is present in beef as well as cows' milk. Clearly it is possible that casein is part of the process that causes BMMF to be in the brain lesions associated with MS. But the question remains: how does all this tie in with the exposure to the Epstein Barr virus?

In his 2021 paper Zur Hausen hypothesized that EBV is reactivated in MS and then the BMMF multiply and are eventually converted into proteins which cause auto-immunity leading oligodendrocytes to malfunction, which leads in turn to the destruction of myelin.

According to Zur Hausen and Kürten the case against cow products is a strong one but if further justification were needed, a paper published in Multiple Sclerosis Journal in 2016 found that one of the biggest cattle rearing areas in South America, Córdoba, Argentina, also has the highest prevalence of MS in Latin America with 88 cases per 100,000 inhabitants.

This prevalence dwarfs that of the Chilean city of Punta Arenas at the very Southernmost and least sunny tip of the continent, which is known for its sheep farming, and has a prevalence of MS of just 14 per 100,000, suggesting that cow products may be a far more powerful predicator of MS even than latitude and lack of sunlight (the vitamin D hypothesis).

Interestingly when I carried out a 93 food IgG (Immunoglobulin) food intolerance screening test I found that cow's milk was the animal product that I had the highest level of sensitivity to, and beef was the meat I was most sensitive to. While I would be the first to admit that this is not conclusive proof that cow's milk and meat are the environmental factor that have played a part in my MS, Professor Kürten's work and the more recent work by Zur Hausen has made me think it is arguably time for all MSers, myself included, to consider cutting out cow's milk from my diet and even cutting out beef too.

If further justification for this radical change to my diet were needed it would come not from my own anecdotal evidence or classical medical research but from a study of occupational risks and MS. The study was carried out by a Danish pension provider PensionDanmark into critical illness insurance cover and those occupational groups most likely to claim it. This research showed that the frequency of MS among "dairy operators," was twice as high as the rest of the study's population. Given the fact that beef has only been linked to MS relatively recently, it may be just a matter of time before beef is next on the banned list for enlightened MSers. I am sure that time will come and come soon.

Picture of cows Alaina McLearnon, unsplash

For further details see page 14

MRI detects myelin repair with over-the-counter antihistamine

An over-the-counter antihistamine drug called clemastine has demonstrated an ability to repair myelin, the protective coating on nerve fibres that's increasingly damaged as MS progresses, according to an analysis of MRI data from the ReBUILD clinical trial.

The changes in myelin were examined with an MRI method that more accurately reflects myelin repair than other measures. The technique can be applied in clinical trials to measure how effective therapies are in prmoting myelin repair and preventing disability. The study, "MWF of the corpus callosum is a robust measure of remyelination: Results from the ReBUILD trial," was published in PNAS.(Proceedings of National Academy of Science)

Several myelin-repairing candidates are under development, but a major hurdle is the absence of validated imaging methods that show restoration. MRI techniques have been developed to measure the myelin water fraction (MWF), the ratio of water trapped within layers of myelin to the water content in brain tissue, most of which can flow more freely.

Changes in the structure of myelin, as seen in MS, alter MWF signals and can act as a proxy for myelin repair. The method hasn't been demonstrated for myelin-repairing treatments, mainly due to a lack of such therapies, prompting researchers at the University of California San Francisco to examine MRI data from 50 adult patients who participated in the now-complete Phase 2 ReBUILD trial (NCT02040298).

In the trial, half the patients were randomly assigned to receive clemastine for three months, while the other half were given it in the third to fifth months. Before treatment, the groups' mean MWF values in the corpus callosum were similar (0.087 vs. 0.088). At three months, the mean MWF increased in those on clemastine (to 0.092) and continued rising two months after the treatment was stopped (to 0.094), indicating myelin repair. Those taking a placebo in the first three months saw their mean MWF value drop to 0.082. With treatment, the value increased up to 0.086.

No significant difference in MWF was observed at three months when the MRI focused on areas of myelin damage, called lesions, suggesting substantial myelin repair occurred in the normal-appearing white matter outside of lesions.

"We present the first positive identification of an MRI correlate of therapy-induced remyelination in a clinical trial (ReBUILD), with a technique that can be employed in a clinically feasible time," the researchers wrote, adding the findings support "corpus-callosum Myelin Water Fraction as a standard for clinical programs investigating remyelinating therapies," a spokesperson for the researchers said. **For details of all news stories go to page 14**

News

High hopes for new trial of anti-plasma drug in prog-MS

A clinical trial of a new drug called Ixazomib is being tested as a potential treatment for progressive MS and is concluding at Barts Hospital in London. Results are expected soon .

The trial called SIZOMUS is testing Ixazomib, the first anti-plasma cell drug clinical trial in the world for MS treatment. Ixazomib is taken as a capsule on days 1, 8 and 15 of a 28 day treatment cycle.

Ixazomib targets plasma cells, a type of immune cell which develops from B cells. Plasma cells produce the antibodies which appear as oligoclonal bands (OCBs) in cerebrospinal fluid – the presence of which is often used as a test for MS during diagnosis. Prior to MRIs "raised oligoclonal bands" detected in a lumbar puncture were sufficient to confirm a diagnosis of MS.

Recent research suggests that plasma cells can live in brain and spinal cord tissues for a long time and may be responsible for long term progression, something often referred to as "smouldering MS".

Ixazomib belongs to a group of drugs known as proteasome inhibitors. Proteasomes are structures present in all cells in the body. They clear up unwanted old proteins so that they don't disrupt the normal functioning and growth of the cell.

Faulty plasma cells make lots of proteins and are reliant on proteasomes to continue to grow and function. Ixazomib binds to proteasomes and prevents them breaking down unwanted proteins, causing the faulty plasma cell to die. Ixazomib is currently used as a treatment for myeloma, a type of bone marrow cancer so would be relatively easy to re-purpose for progressive MS.

The Sizomus trial is a phase I/II study has recruited 72 participants with relapsing remitting and progressive MS. There are two main aims of this study: firstly, to test whether ixazomib is safe and well-tolerated by people with MS; and secondly, whether it can reduce or eliminate oligoclonal bands from cerebrospinal fluid (CSF). Side effects will be recorded and oligoclonal bands in CSF (involving lumbar punctures) measured at the beginning of the study and at 24 months. The completion date was August 2023 and results are expected imminently. This is a drugs trial worth looking out for**.**

For details of all news stories go to page 14

Brain stimulation may offer promise for MS spasticity

Non-invasive brain stimulation (NIBS) may help to treat spasticity MS, according to a new review study which looked at other studies and tried to find the best approach. The studies under review generally indicated that a type of brain stimulation called repetitive transcranial magnetic stimulation, or rTMS, could ease spasticity — when muscles become abnormally tight, as commonly occurs in MS. However, evidence for another approach, known as transcranial direct current stimulation or tDCS, was more limited.

“Seven studies that used rTMS demonstrated a significant decrease in spasticity in PwMS [people with multiple sclerosis] after the intervention,” the researchers wrote, noting that “the remaining studies that provided tDCS did not show meaningful effects.”

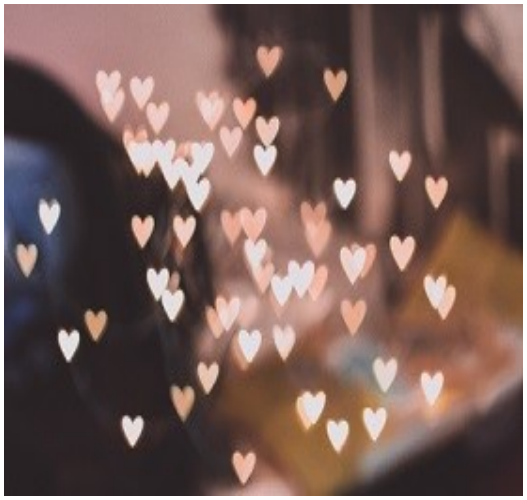
The team said more clinical trials with long-term follow-up are needed to find the best approach. The study, “Non-invasive brain stimulation for spasticity rehabilitation in multiple sclerosis: A systematic review of randomized controlled trials,” was published in the journal PM&R. Non-invasive brain stimulation, dubbed NIBS for short, includes techniques such as rTMS and tDCS. In general, NIBS refers to interventions in which brain cells are stimulated via electrical currents to the scalp. In the case of rTMS, a magnetic field is used to stimulate the brain cells, whereas tDCS accomplishes this via low levels of direct electrical current.

It’s thought that this stimulation helps to induce neuroplasticity, the process by which the brain rewires in response to new inputs. This is believed to be of benefit for people with MS and other neurological diseases. A team from the Middle East University, in Jordan, conducted a systematic review of previous clinical trials that evaluated the effects of NIBS on spasticity-related outcomes in MS patients.

A total of nine randomized, controlled studies were included, NIBS approaches included rTMS (seven studies) and tDCS (two studies), with the protocol and device used varying between studies. Among the studies involving rTMS, four combined the NIBS approach with standard physical therapy, while three used brain stimulation alone. All seven studies found a significant decrease in muscle tone of the lower extremities — specifically the legs, ankles, and feet — with the NIBS intervention.

In the two tDCS studies, one did not find a significant change in lower extremity muscle tone. The other saw physiological evidence of less muscle contraction, but a clinician-rated measure of spasticity was not altered. Given the benefits of physical exercise in MS and in combination with rTMS — as well as its potential effects on neuroplasticity — researchers believe that combining tDCS with physical rehabilitation interventions “may have superior effects in reducing spasticity in PwMS than using tDCS alone.”

For further information go to page 14



Life, love and prog-MS

Anyone who has read the stats will know that MS is a huge burden on a relationship. Just in case you aren't familiar with the figures they read like this - men with MS have a 21% higher risk of divorce then men without the condition. Paradoxically the figures for women are not the same with there being little difference.

So, it's a male problem. As a man who has separated from several partners I have undergone a lot of soul searching trying to work out why relationship breakdowns have happened repeatedly to me, a male prog-MSer. It would be easy to go down the role of sexual stereotyping and say that men are generally seen as the great providers and that once advancing, MS means we are unable to fulfil this role and instead become the needy partner and we fail to play our allotted roles and suffer as a consequence.

Of course, diving into such easy explanations, or excuses, is sexual stereotyping, and involves an element of blaming the other, so it would be more productive for me to ask what role, either direct or indirect, my illness and how I handle it has played in my relationship break-ups. In so doing I can hopefully better understand my condition and the impact it has on relationships in the hope that I can learn and avoid making the same mistakes again and again. I know I'm 65 but better late than never. So here goes.

A former partner of more than ten years once told me that my MS had played a part in her choosing to leave me. Another former partner was a poet and she used to contribute to the poetry section of local magazines and during our relationship many of these poems were about me and my MS so are quite illustrative.

One poem I have kept is titled "Love and MS". In this poem there are frequent references to "a cloud" being present in our relationship. To quote the poem directly: "The cloud defines our lives in everywhere we go. It has a life of its own, MS is its name."

"**Continued on page 11**

Continued from page 10 The metaphor of a cloud is interesting because clouds are generally negative metaphors “dark clouds” “cloudy”, their association with rain are all fairly gloomy and pessimistic. Clouds block the sun. As to emphasise the negative influence of MS the poem goes on: “Alone I will face the storm, but you won’t be there, tears and rain, like love and pain will be the ones I feel”.

One of the paradoxes of MS is that you live with a condition that impacts greatly on your life but because it is always there you don’t really notice it on a day to day basis, unless it changes or advances unexpectedly quickly. For a partner of someone who has MS I guess things are quite different. It is there all the time, like my former partner said it can be like a “cloud” hanging over the relationship.

Last week I caught a glimpse of my reflection in a shop window as I limped through a shopping centre and was shocked to see how bad my walking has become. Although I had been aware of the difficulties in walking even short distances for some time, I was not aware of what my walking actually looked like to someone else. It was not a pretty sight.

Seeing the “real me” was helpful nevertheless because it forced me to accept what my MS really looks like to others close to me. For much of my MS I have subconsciously denied my MS. To begin with I told myself I had been misdiagnosed. When I accepted I really had MS, I told myself it would always be “benign” and when it became progressive I told myself I would be cured. All these things are little lies, but lies nonetheless. To live a lie is a psychological strategy fraught with problems for the self deceiver, but it makes life even more difficult for their partner. The partner can see the struggles that life presents for the person with progressive MS and are doubtless aware of their partner’s futile denial strategy. The real problem may be that the partner of the self-deceiving MSer has to live that lie too although they can see through the lie with greater clarity than the self-deceiver.

Perhaps what I am saying is that MS is always going to be a great challenge to any relationship but how you choose to handle it and whether you accept it emotionally and practically will have an impact on the likelihood of your relationship surviving. Trying to pretend that MS doesn’t really have that great an impact on my relationships, when clearly it does, is living a lie. With hindsight I would acknowledge that living a lie isn’t perhaps the great idea I thought it was at the time.

For details of all news and features go to page 14 **Photo p10 by freestocks on Unsplash**

Progressive MS trial of vidofludimus calcium is fully enrolled

A global Phase 2 clinical trial investigating the oral therapy vidofludimus calcium (IMU-838) in people with primary and secondary progressive MS has reached full enrolment, the treatment's developer, Immunic Therapeutics, has said.

The trial, which sadly isn't recruiting in the UK, is assessing whether the neuroprotective effects of vidofludimus calcium seen in people with relapsing-remitting MS (RRMS) also extend to those with primary progressive MS (PPMS) or secondary progressive MS (SPMS).

The company plans to share data from a first interim analysis in the coming months. This analysis will include biomarker data, such as changes with treatment versus a placebo in neurofilament light chain (NfL), a marker of nerve damage. Data will be collected from the first half of patients — about 225 people — who reached six months of follow-up. Top-line data from the full group of 467 patients is expected in April 2025.

Vidofludimus calcium is an oral therapy designed to slow MS progression by interfering with the normal metabolism of immune cells that drive inflammation and cell death in MS. It works by blocking the dihydroorotate dehydrogenase (DHODH) enzyme, which is involved in the activation of such immune cells.

While this mechanism is shared with that of the approved therapy Aubagio (teriflunomide), vidofludimus calcium exerts neuroprotective effects that have not been observed with the older drug — possibly because it potently activates a protein called Nurr1. Most commonly found in nerve cells, Nurr1 has neuroprotective and anti-neuroinflammatory activity, and it is an emerging therapeutic target for neurodegenerative diseases such as MS, Parkinson's, and Alzheimer's.

A trial called CALLIPER has enrolled 467 patients with either PPMS or active or nonactive SPMS at more than 70 sites across North America, and Western, Central and Eastern Europe. All participants were without evidence of relapses in the past two years, and they have been randomly assigned to a placebo or to 45 mg of vidofludimus calcium for up to 120 weeks, or about 2.5 years. After that, patients will have the option to enter an open-label extension period, where all will receive vidofludimus calcium for up to eight years.

The trial's main goal is to assess if vidofludimus calcium can slow the annual rate of brain shrinkage over the 120 weeks compared with a placebo. Secondary measures include changes in brain volume over the first 24 weeks (about six months), and whether the treatment extends the time to confirmed disability progression.

For details of all stories go to page 14

First genetic marker for MS severity identified

Scientists have discovered a genetic variant that correlates with a faster progression of multiple sclerosis (MS).

Previous studies have shown that the risk for MS lies in part in a dysfunction in the immune system. Treatment can slow down the disease's progression, but the researchers wrote that "these risk factors don't explain why, ten years after diagnosis, some MS patients are in wheelchairs while others continue to run marathons."

The study, which encompassed more than 22,000 people with MS, was the result of an international collaboration of over 70 worldwide institutions, led by researchers from the University of Cambridge in the UK, and UCSF in the US.

After sorting through seven million genetic variants, researchers identified one associated with faster MS progression. It sits between a gene involved in repairing damaged cells called DYSF, and one that helps to control viral infections, called ZNF638. Neither of these genes have a prior connection to MS, but researchers think that their proximity to the identified gene suggests they might be involved in MS progression.

"These genes are normally active within the brain and spinal cord, rather than the immune system," said Dr Adil Harroud, lead author of the study and former postdoctoral researcher in the Baranzini Lab at UCSF "Our findings suggest that resilience and repair in the nervous system determine the course of MS progression and that we should focus on these parts of human biology for better therapies."

The researchers also found that years in education and parental age were linked to MS severity, and that smoking worsened it. "Although it seems obvious that your brain's resilience to injury would determine the severity of a disease like MS, this new study has pointed us towards the key processes that underlie this resilience," they said.

Scientists will do more work to determine exactly how this variant affects DYSF, ZNF638, and the nervous system. They are also collecting an even larger set of DNA samples from people with MS, expecting to find other variants that contribute to long-term disability in MS.

For details of all news stories see page 14

References further details, etc

Page 2 EBV vaccine

https://www.healthline.com/health-news/the-epstein-barr-virus-is-linked-to-ms-risk-an-experimental-vaccine-may-help-stop-it?slot_pos=article_5&utm_source=Sailthru%20Email&utm_medium=Email&utm_campaign=daily&utm_content=2023-08-14&utm_term=s:hl_n:daily&apid=24834890&rvid=c0c8ef670530e7c1eab796a0b5b980a1d90c8608c51445474bd68ecb92ccfac1#The-bottom-line:

Page 3 vitamin D in prog-MS animal model

https://multiplesclerosisnewstoday.com/news-posts/2023/08/04/progressive-ms-reduced-rats-with-vitamin-d-supplementation/?utm_source=facebookorganic&utm_medium=organic_social&utm_campaign=new_image&utm_content=202308182100

Page 4 ATA 188 trial results due in November

https://multiplesclerosisnewstoday.com/news-posts/2023/08/21/embold-study-data-90-ms-patients-given-ata188-now-due-

page 5-6 Bovine MS link

https://www.medscape.com/viewarticle/989558?ecd=mkm_ret_230323_mscpmrk_onc_crc&uac=347459AX&impID=5269064#vp_1

https://www.sciencedaily.com/releases/2022/03/220301131110.htm#:~:text=Multiple%20sclerosis%20sufferers%20often%20complain,insulating%20layer'%20around%20nerve%20cells

Page 7 Clemastine/re-myelination link

https://multiplesclerosisnewstoday.com/news-posts/2023/06/16/mri-analysis-ms-rebuild-data-shows-myelin-repair-clemastine/?utm_source=facebookorganic&utm_medium=organic_social&utm_campaign=weekly_dyk&utm_content=202308161900

Page 8 Sizomus study

https://mstrust.org.uk/a-z/ixazomib

Page 9 Brain stimulation to help spasticity

https://multiplesclerosisnewstoday.com/news-posts/2023/08/23/brain-stimulation-promising-ms-spasticity-but-more-work-needed/?utm_source=MS&utm_campaign=8c0d08a31e-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_b5fb7a3dae-8c0d08a31e-71290133

Page 10-11 love and MS

For good advice on MS in relationships go to https://www.medicalnewstoday.com/articles/dating-someone-with-ms#emotional-impact

Page 12 Vidofludimous calcium trial

https://multiplesclerosisnewstoday.com/news-posts/2023/08/22/phase-2-trial-vidofludimus-calcium-progressive-ms-

Page 13 First genetic marker for MS severity identified

https://ms-uk.org/news/first-genetic-marker-for-ms-severity-identified/

To Contact me email iancookjournalist@yahoo.co.uk or via twitter@iancookMSer

DISCLAIMER:

This ezine is strictly a news and information ezine/website about MS . It does not provide medical advice, diagnosis or treatment. This content is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Always seek the advice of your doctor or other qualified health provider with any questions you may have regarding MS or any a medical condition. Don't disregard professional medical advice or delay in seeking it because of something you have read in this ezine.

To Contact me email iancookjournalist@yahoo.co.uk or via twitter@iancookMSer