Dissolution of Spike Protein by Nattokinase

Holy Grail of COVID-19 Vaccine Detoxification

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By Peter A. McCullough, MD, MPH

Far and away the most common question I get from those who took one of the COVID-19 vaccines is: "how do I get this out of my body." The mRNA and adenoviral DNA products were rolled out with no idea on how or when the body would ever breakdown the genetic code. The synthetic mRNA carried on lipid nanoparticles appears to be resistant to breakdown by human ribonucleases by design so the product would be long-lasting and produce the protein product of interest for a considerable time period. This would be an advantage for a normal human protein being replaced in a rare genetic deficiency state (e.g. alpha galactosidase in Fabry's disease). However, it is a big problem when the protein is the pathogenic SARS-CoV-2 Spike. The adenoviral DNA (Janssen) should broken down by deoxyribonuclease, however this has not be exhaustively studied.

This leaves dissolution of Spike protein as a therapeutic goal for the vaccine injured. With the respiratory infection, Spike is processed and activated by cellular proteases including transmembrane serine protein 2 (TMPRSS2), cathepsin, and furin. With vaccination, these systems may be avoided by systemic administration and production of Spike protein within cells. As a result, the pathogenesis of vaccine injury syndromes is believed to be driven by accumulation of Spike protein in cells, tissues, and organs.

Nattokinase is an enzyme is produced by fermenting soybeans with bacteria Bacillus subtilis var. natto and has been available as an oral supplement. It degrades fibrinogen, factor VII, cytokines, and factor VIII and has been studied for its cardiovascular benefits. Out of all the available therapies I have used in my practice and among all the proposed detoxification agents, I believe nattokinase and related peptides hold the greatest promise for patients at this time.

Tanikawa et al examined the effect of nattokinase on the Spike protein of SARS-CoV-2. In the first experiment they demonstrated that Spike was degraded in a time and dose dependent manner in a cell lysate preparation that could be analogous to a vaccine recipient. The second experiment demonstrated that nattokinase degraded the Spike protein in SARS-CoV-2 infected cells. This reproduced a similar study done by Oba and colleagues in 2021.

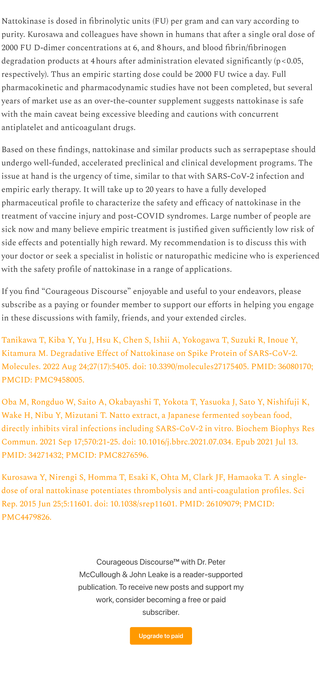

Figure 2. (**A**) Degradative effect of nattokinase on S protein on the cell surface. Spike-pcDNA3.1 was transfected with HEK293 cells and incubated for 9 h. After incubation, nattokinase (25 and 2.5 μg/mL) were added to culture medium and further incubated for 13 h. Cells were fixed and immunofluorescent analysis was performed. S protein on the cell surface was stained with anti-spike protein antibody (Red) and nucleus was stained with DAPI (Blue). (**B**) Ratio of S protein area to nucleus positive area. Three images per sample were captured and S protein/nucleus positive area were calculated. Data are shown as mean + SD, and *p*-value was determined by one-way analysis of variance (ANOVA) with Tukey's post-hoc test using R software (R-3.3.3 for windows) (** *p* < 0.01; *** *p* < 0.001). (**C**) Cell viability was evaluated by MTT assay. Indicated nattokinase was added to culture medium and incubated for 13 h; MTT assay was performed.

Tanikawa T, Kiba Y, Yu J, Hsu K, Chen S, Ishii A, Yokogawa T, Suzuki R, Inoue Y, Kitamura M. Degradative Effect of Nattokinase on Spike Protein of SARS-CoV-2. *Molecules*. 2022 Aug 24;27(17):5405. doi: 10.3390/molecules27175405. PMID: 36080170; PMCID: PMC9458005.

Nattokinase is dosed in fibrinolytic units (FU) per gram and can vary according to purity. Kurosawa and colleagues have shown in humans that after a single oral dose of 2000 FU D-dimer concentrations at 6, and 8 hours, and blood fibrin/fibrinogen degradation products at 4 hours after administration elevated significantly (p <0.05, respectively). Thus an empiric starting dose could be 2000 FU twice a day. Full pharmacokinetic and pharmacodynamic studies have not been completed, but several years of market use as an over-the-counter supplement suggests nattokinase is safe with the main caveat being excessive bleeding and cautions with concurrent antiplatelet and anticoagulant drugs.

Based on these findings, nattokinase and similar products such as serrapeptase should undergo well-funded, accelerated preclinical and clinical development programs. The issue at hand is the urgency of time, similar to that with SARS-CoV-2 infection and empiric early therapy. It will take up to 20 years to have a fully developed pharmaceutical profile to characterize the safety and efficacy of nattokinase in the treatment of vaccine injury and post-COVID syndromes. Large number of people are sick now and many believe empiric treatment is justified given sufficiently low risk of side effects and potentially high reward. My recommendation is to discuss this with your doctor or seek a specialist in holistic or naturopathic medicine who is experienced with the safety profile of nattokinase in a range of applications.

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I have asked my covid-vaccinated patients to take nattokinase 2000 units per day, while running these labs every 3 months: D-dimer, CBC/platelets, fibrinogen, PT/INR. Naturopathic physicians have recommended nattokinase and similar for decades for our cardiovascular patients, and I have never known it to cause new problems. It seems to be generally well-tolerated.

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DeeDee Winter Feb 21

It is with DEEP GRATITUDE that I say "Thank You" for each and every article you send out and with the same gratitude that I thank God for your life and my introduction to you at the Tyler symposium in 2021.

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