



EDITORIAL

Selected reflections of the third Fascia Research Conference (FRC3), Vancouver BC, March 2012[☆]

It is not easy to describe the intellectual and social atmosphere that characterized the gathering of around 800 delegates at the FRC3, at the end of March. Several commissioned reports will be published in JBMT, but more informally, a number of those attending were asked to briefly set down detail of their particular sense of what made the conference memorably different. This selection of those observations provides specific examples of high-points, as well as something of the flavour and colour of the backdrop in which the concept of translational research came alive, as clinicians, therapists, practitioners and researchers interacted for three hectic days of the conference proper, as well as during a diverse range of pre- and post-conference workshops, and the inevitable and somewhat frenetic net-working during breaks, meals and social gatherings. I know of one extreme example - a 6.45 am pre-breakfast, power-walk meeting!

The keynote presentation that I personally found of most interest was that by Gerald Pollack (*The Secret Life of Water: $E = H_2O$*). See photograph in this page.

Dr. Pollack reported that a fourth phase of water has been identified, beyond the three phases of solid, liquid and vapor. This phase occurs immediately adjacent to water-loving (hydrophilic) surface, and is surprisingly extensive, projecting out from the surface by up to millions of molecular layers. This fourth phase is charged, while the water just beyond it is oppositely charged, in effect creating a current producing battery. Pollack's research has found that light recharges this battery, so that water can receive and process electromagnetic energy drawn from the environment — much as plants do. Absorbed-light energy can then be exploited to produce electrical and mechanical effects. (see further reading recommendation list).

These discoveries not only provide an understanding of how water processes solar and other energies, but may also provide a foundation for simpler understanding of natural phenomena ranging from weather and green energy, all the

way to biological issues, including fluid transport, osmosis — and tissues such as fascia.

Information from Dr Pollack's presentation, and that of Dr Rolf Reed on fluid dynamics, was expanded on by a panel discussion that examined the clinical relevance of this research — most particularly in relation to human physiology in general and fascia in particular. This theme of fluid dynamics and fascia is explored further below in the reflections on FRC3 by a number of contributors to the informal series of reflections.



Dr Gerald Pollack

[☆] With contributions from: Michael Schneider PhD, Paolo Tozzi PT DO, Thomas Myers LMT, Diane Lee BSR FCAMT, Robert Schleip PhD, Eric Blake ND, Erik Dalton PhD.

Michael Schneider DC PhD summed up the atmosphere that permeated the week in Vancouver:

"There were clearly two general mindsets - the researcher-mindset and the clinician-mindset. It was impressive to me to see such a collegial dialogue and communication between participants from both perspectives. It seemed to me that the researchers were going out of their way to better understand ways to improve upon the clinical relevance of their basic science research. And conversely, the clinicians were focused and attentive to the scientific research presentations in an effort to better understand how basic science findings could inform their clinical practices. It is through this type of mutual respect and professionalism that true collaborative research efforts can begin to blossom and bear fruit. A wonderful success story of the synergy between the mindsets of scientist and clinician – and a highlight of the conference – is the research collaboration that has developed between Geoff Bove (neuroscientist) and Susan Chapelle (massage therapist) on the important topic of treating/preventing post-surgical adhesions. I hope to see more successful collaborative relationships develop from the FRC3 and future fascia conferences". See photograph of Dr Bove on this page.



Dr Geoff Bove

Paolo Tozzi DO PT expanded on this theme:

"Probably, as never as before, scientists and clinicians gathered together to experience a mutual interaction in the Third Fascia Research Congress in Vancouver. During those intense days, each participant had the chance to breath at the edge of a new frontier of intended and actual

current scientific research. The enthusiasm of sharing and joining objectives, coming from different backgrounds, was tangible and available to a new form of science, based on cooperation, collaboration and a multidisciplinary approach. Once again, the Fascia has clearly shown its ability to connect, not only tissues, but also different professions, perspectives and outcomes. The latest findings on fluid dynamics, within and surrounding the connective tissue, has offered a new vision beyond mechanical and structural dimensions. What was presented (by Gerald Pollack PhD) was evidence of a biological fluid that doesn't only demonstrate water-like properties, but has the ability to assemble and remodel itself, and potentially to retain or release information in different forms, involving electromagnetic, chemical, mechanical and fluid signals. The complexity of the connective-myofascial-tensegrity-based fascial system therefore now requires a new multidimensional research approaches in order to be understood".

Tom Myers LMT provided a selection of high points that reflect his particular interests:

"After the first Fascial Research Congress, I commented that while the scientists and the practitioners might be climbing the same mountain, they were on opposite sides, and still a long way from each other. Now the end of FRC3, I am convinced that movement on both sides has breached much of that divide.

This conference was so delicious that I sacrificed my health to it, too rarely leaving the hotel and too often eating the wrong food, so I ended up down with the flu – but it was worth it. If I were to complain, it is only that my own interest lies firmly with how the fascial dynamics work in health and normal development, while the focus of many research projects and practitioners is understandably on pathology and pain. Also, to air my other prejudice, I am less knowledgeable (or interested) in the chemistry, and more interested in fascial architecture and intercellular biomechanics.

Even for someone of my bent, there was plenty of juicy new fascial 'gossip' and telling images in the research findings, mostly about the 'mechanosome' (a term from Albert Banes PhD) – i.e. how is the body held together?

Michael Kjaer MD showed the villi-like intertwined fingers of cell projections, held together with cadherins and tenascin-C at the strenuous myotendinous junction – the fingers gripped around the rope at the site of the tug-o-war.

Albert Banes completed the connection of mechanics (of course it's all biochemistry, but it is also a biomechanical machine of a highly refined order) all the way from the intercellular space through the membrane, the cytoskeleton, through the nuclear membrane all the way to the DNA, whose shape and expression are plucked like guitar strings via the transmission of mechanical forces. Rolf Reed PhD brought a fascinating new concept to my understanding: the interstitial pressure, and the role of integrins in maintaining the restraint on the hyaluron and **GAGs**. When the integrins are damaged or 'knocked out', the hydrophilic proteins are not restrained, and they swell – suggesting that swelling pain and tumors might ultimately be treated by managing the integrin matrix, rather than attacking the chemical pathways.

Dr Reed also gave us an 'aha!' moment: Mice with the integrin gene 'knocked out' were not eating, and they

wondered about the biochemical route for this phenomenon, but again, stick with the mechanics: they were not eating because, without integrins, their teeth were loose in their heads and eating was uncomfortable. Stay open, he said in his quiet Norwegian way.

I must also mention Susan Chapelle LMT, who, along with Geoffrey Bove DC PhD, showed bravery and intrepid determination to make the most direct demonstration of the simple but essential link: putting your hands on tissue alters that tissue. The promise of the FRC project is that we get better at seeing how it works, and thus we get better at doing it”.

Diane Lee BSR FCAMT reported her high points:

“There were several highlights for me from the 3rd Fascial Research Conference and if I were to pick one it would be the preconference dissection course and the lectures presented by Drs. Carla Stecco and Antonio Stecco. While I have read their research publications prior to this conference, I didn’t appreciate, or fully understand, the highly complex and organized nature of the superficial and deep fascial systems until I saw them in the anatomy lab. The different receptors in each layer of fascia as well as the relationship between the deep fascia, epimysium and associated muscle spindles combined with the totally ‘new to me’ information from Dr. Gerald Pollack and the ‘Secret Life of Water’ has left me pondering many things about our specific release techniques, as well as fascial taping techniques, and the possible mechanisms underlying their efficacy”.

Continuing the theme of clinical relevance, emerging from keynote presentations, researcher and Rolfer, **Robert Schleip PhD** observes:

“I particularly liked the high level of discussions after the main presentations. Most of the questions came from peer scientists, who offered alternative interpretations of the presented results. But also many educated clinicians asked very relevant questions that helped presenters to clarify their suggested implications for the audience. There was an almost palpable atmosphere of excitement in the air, as people were aware that they were taking part in an outstanding event, at which new material from leading scientists was presented, that might strongly impact the future development in their field. I think that the resultant sense of appreciation contributed a great deal to the cooperative and enthusiastic participation of all involved”.

“Regarding the new scientific content, two aspects have been most meaningful for me. First was the keynote lecture by Michael Kjaer MD DMSc (*Adaptation of Tendinous Connective Tissues to Exercise*) on how sports and exercise shape our connective tissues. While relating to very specific scientific data, he ended up offering clear suggestions as to which types of exercise training, at what intervals, and at what loading magnitudes, would be best for increasing fascial resilience as well as helping to prevent connective tissue injuries. It was new to me to learn how specifically women’s connective tissues – depending on their estrogen level at the time – tend to react differently to those of men. Currently there is a great interest in fascia emerging within all fields of sports medicine. It would therefore be not at all surprising, if at the next congress (Orlando, 2015) the current dominance of manual therapists within the audience will be broken, or at least matched, by the active

participation of professionals from the sports/fitness/Pilates/yoga scene. Some of the melting hugs in the hallways may then look a bit shorter... but I think we clinicians will continue to be inspired as to how to engage our clients in more healthy movement practices in their daily lives. Michael Kjaer’s brilliant lecture was therefore an important milestone in this promising field.

The other meaningful novel aspect was the information as to how fluid shear within ground substances specifically influences fibroblast behaviour. The two excellent keynote lectures from Rolf Reed PhD (*Fluid Dynamics*) and Gerald Pollack PhD - both of whom pointed out how slow manual pressure on the sponge-like ground substance can induce long lasting shifts in internal fluid dynamics, profoundly altering physiological and biomechanical tissue properties. My clinical work has already profited from that when working with tissues that feel less ‘juicy’ to me, I now take great pleasure in working even more slowly with them, while focusing attention on how to reach the most hidden micro-vacuoles within the tissues. Remembering Gerald Pollack’s impressive findings regarding the ‘liquid crystal’ dynamics of bound water in fascia, I now imagine how some of the non-bound water molecules under my hands are being squeezed out from these hidden pockets, so that they can then be subsequently replaced by new and fresher ones. This perspective resonates well with recent findings from our fascia laboratory at Ulm university, in which we showed how strongly mechanical loading can alter the water content in fascial tissues (vol. 16, p. 94–100 of this journal). I am most curious to see current measuring tools – such as magnetic resonance imaging, or electrical impedance meters – becoming refined enough for in-vivo testing of how different myofascial techniques may alter the water content and constitution in the tissues being treated. From what I heard at this congress, we are only months away from that happening. I can’t wait”.

Eric Blake ND offered a background to his particular experience of FRC3:

“As a practicing clinician I have a heterogeneous patient base – orthopedic, infectious, chronic degenerative, traumatic, metabolic, autoimmune etc. When I attend conferences and congresses I look for those that have a broad tablet of clinical relevance and application. In advance of this event I was ambivalent, unsure that the 3rd International Fascia Research Society would have clinical application outside of orthopedics, and that it would be focused on research rather than clinical use. My ambivalence was entirely unwarranted. Breadth of experience was the rule of the day. To begin, there was a truly international representation of researchers, medical physicians, rheumatologists, surgeons, osteopaths, chiropractors, physical therapists, naturopathic physicians, massage therapists, etc. With 800 participants the organizers kept the smooth flow of meals, breaks, introductions, moving smoothly without conflict or confusion - not an easy task. The concepts, techniques, and discussions were at a very high level with incredibly broad practical clinical implications. I avidly took notes as I gained insights on various active cases currently under my care, and reflected on others in the past, based on the content at hand. The poster sessions was so worthwhile and broadly applicable that I scheduled several hours to ensure that I would review each one.

As a teacher and educator in the field of physiotherapy and hydrotherapy I rarely encounter fundamental shifts in the extant knowledge base. However, Dr. Pollack's presentation on water was exactly that. The outcomes of his research and observation of fundamental natural hydrological phenomena has implications that has the potential to influence numerous other scientific fields.

Overall a highly recommended event, and I now look forward in anticipation of the next".

Erik Dalton PhD describes his congress highlights as follows:

"The FC3 sessions were rich with information but a fascinating discussion concerning the exciting future of fascial imaging techniques, with a panel of all stars, including Helen Langevin, Diane Lee, Raúl Martínez Rodríguez and Antonio Stecco, moderated by Leon Chaitow was, for me, the highlight of this congress.

What a thrill to witness the advancements and direction fascial imaging has taken since the 2007 Harvard Congress. Diane Lee's dramatic ultrasound imaging of superficial and deep tearing of the linea alba in postpartum women prompted me to re-evaluate my own my treatment protocols. She demonstrated, for example, that it is simply not helpful to assume that superficial diastasis healing is any indication that the deep abdominal canister is also repaired and core support restored.

Through various imaging technologies, Raúl and Antonio Stecco highlighted the need for specific tracking of the "types" of force therapists apply to various tissue layers. Using video-recorded real-time imaging of combinations of torsion, shear, traction and compression methods, Raul showed the manual restoration of gliding function to a deeply scarred and thickened quadriceps muscle, in a man gored by a bull - while the crowd of 800 clinicians and scientists sat speechless.

To palpate this type of deep musculo-fascial scar tissue release is one thing, but to witness the event through new sonoelastography imaging, in real time is quite another. The Vancouver Congress made me anxious to get back to my practice and start applying this new insight knowing that FC4 will also offer me, among many others, the opportunities to learn and reshape the peoples of the world". If these selected reflections, by those who attended and participated in the conference, provoke a desire to witness the conference presentations, you will be able to do so on a conference DVD. Contact the Ida P Rolf Research Foundation for details of when these will be available. <http://www.rolfresearchfoundation.org/>.

Selected reading recommendations:

- Banes, A.J., Tsuzaki, M., Wall, M., et al., 2007. The molecular biology of tendinopathy: signalling and response pathways in tenocytes. In: Woo, S., Renstrom, P., Arnoczky, S. (Eds.), *Tendinopathy in Athletes* (Volume XII of the Encyclopedia of Sports Medicine). Blackwell Publishing, Ames, IA.
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- Pollack, G.H., Figueroa, X., Zhao, Q., 2011. In: Luisi, P.L., Stano, P. (Eds.), *The Minimal Cell and Life's Origin: Role of Water and Aqueous Interfaces*. Springer.
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