

CONFERENCE REPORT

“SKELETAL MUSCLE: FROM MOLECULES TO FUNCTION”

Padua, Italy, 1st October 2018

It was a handful of students, almost eight centuries ago, who founded one of the first universities in Europe: 1222 marked the birth of the University of Padua, destined to welcome teachers such as Galileo Galilei and Andreas Vesalius (from: <http://www.unipd.it>).

Prof. Carlo Reggiani began his academic journey at the University of Pavia back in 1974. After spending 5-years learning in the laboratory of prof. Paul Edman at the University of Lund, he was appointed as an Associate Professor at the University of Pavia in 1984 and in November 1999 he joined the Medical School staff as a full professor at the University of Padua, one of the oldest universities.

October 1st 2018 marked another great day in the life of the University of Padua and Carlo's friends and colleagues. Carlo celebrated his 70th birthday and announced his retirement. Along with attending the Conference devoted to his achievements, we had an opportunity to envisage his great achievements and anecdotes during the presentations by his friends, students and colleagues. The Conference was organised by his colleague and friend, Prof. Marco Narici, in Aula Magna of Palazzo Bo, a historical mecca of physicians. Saving the best for the last, Carlo's talk began with a story of Scheherazade.

The king Shahryar found out that his first wife was unfaithful to him. He thus resolved to marry a new virgin each day as well as behead the previous day's wife, so that she would have no chance to be unfaithful to him. He had killed 1,001 such women by the time he was introduced to Scheherazade. Once in the king's chambers, Scheherazade's sister asked her to tell a story during the long night. The king lay awake and listened to Scheherazade told her first story. The night passed by and Scheherazade stopped in the middle. The king asked her to finish, but Scheherazade said there was no time, as dawn was breaking. So, the king spared her life for one day to finish the story the next night. The following night, Scheherazade finished the story and then began a second, even more exciting tale, which she again stopped halfway through at dawn. Again, the king spared her life for one more day, so she could finish the second story. And so, the king kept Scheherazade alive day by day, and at the end of 1,001 nights, and 1,000 stories, the king had fallen in love with Scheherazade (summarised from: Scheherazade).

And similarly to the stories of Scheherazade, Carlo experimented in thousands of muscle fibres from animals, humans, young, old, athletic, sedentary, himself, etc. Pre-



paring each intact fibre under the microscope for 30-60 minutes to investigate its contractile properties. And finally, allowing time for one more. And another.

His work was enormous (more than 220 scientific articles, and more than 8000 citations) and we are proud to share bits of his academic career. We have collaborated in six scientific articles since 2008, reporting data from the studies where we listened, learned, discussed, and had fun.

We compared the responses of older and young men to 14 days of bed rest and subsequent rehabilitation. The effect of inactivity on muscle mass and function was greater in older men, whereas metabolic alterations were greater in young men. Recovery of preinactivity conditions occurred more slowly in older men. The results emphasize the importance of avoiding or minimizing the periods of inactivity in old age (Pišot, Reggiani, Šimunič, et al. J Appl Physiol, 2016).

As we jointly discovered, it is important to know that we need to compensate for old age and to avoid periods of inactivity.

Dear Carlo, since your thirties, you have lost 6 kilos of muscle fibres. That is the exact amount found in this prosciutto. Most of muscle loss is due to decrease of

daily physical activity, therefore you will need to increase it for what you will need this exercise T-shirt. To support your exercise, you will need to increase intake of certain carotenes, minerals and vitamins. You will find them in this bottle of olive oil; however, for the vitamin D you will need to expose yourself to the sun. Which we believe you will have no trouble during your retirement. Blood will distribute your nutrition to your new working muscle and for that purpose you will need to compensate for the lost blood. To compensate for plasma and erythrocyte volume you will need to ingest these two bottles of Malvasia and Refosco wine, respectively. (from the presentation of Rado Pišot and Boštjan Šimunič)

It was a great pleasure that our Institute for Kinesiology Research took part at this Conference and that you also cooperated with our Institute. Thank you, Carlo!

Boštjan Šimunič, Rado Pišot
and other members of the Institute for Kinesiology Research

POROČILO IZ KONFERENCE »SKELETNE MIŠICE: OD MOLEKULE DO FUNKCIJE«

Padova, Italija, 1. oktober 2018

Bila je le peščica študentov, ki je pred skoraj osmimi stoletji ustanovila eno prvih univerz v Evropi. Leto 1222 predstavlja rojstvo Univerze v Padovi, ki bo kasneje gostila tako pomembne učitelje, kot sta bila Galileo Galilei in Andreas Vesalius (povzeto po: <http://www.unipd.it>).

Prof. Carlo Reggiani je začel svoje akademsko pot na Univerzi v Pavii v Italiji leta 1974. Kasneje se je pet let izpopolnjeval v laboratoriju prof. Paula Edmana na Univerzi v Lundu na Švedskem, leta 1984 pa je bil imenovan za izrednega profesorja na Univerzi v Pavii. Novembra leta 1999 se je kot redni profesor pridružil osebju ene najstarejših univerz na Fakulteti za medicino in kirurgijo Univerze v Padovi.

1. oktober 2018 označuje še en pomemben dan za Univerzo v Padovi in za vse prijatelje in kolege Carla Reggianija. Ta dan je namreč hkrati praznoval 70. rojstni dan in odhod v pokoj. Ob konferenci, posvečeni njemu v čast, smo imeli priložnost podoživeti nekaj utrinkov iz njegove bogate kariere skozi predstavitev njegovih znanstvenih dosežkov pa tudi anekdot iz življenja, skozi oči njegovih prijateljev, študentov in kolegov. Konferenco je organiziral njegov prijatelj in znanstveni kolega prof. Marco Narici v t. i. Veliki predavalnici (Aula Magna) v znameniti univerzitetni palači Bo, ki je še danes neke vrste zgodovinska Meka vseh zdravnikov. Carlo je svoj nagovor na kongresu pričel z znano zgodbo o Šeherezadi:

Sultan Šahrijar je ugotovil, da mu je bila njegova prva žena nezvesta. Odločil se je, da se bo vsak dan poročil z novo devico, hkrati pa bo vsak dan dal obglaviti svojo ženo iz prejšnjega dne. Prepričan je bil, da bo lahko le tako preprečil svoji ženi nezvestobo. Do tistega dne, ko so mu kot novo nevesto predstavili Šeherezado je ubil že tisoč in eno dekle. Ko je bila Šeherezada v sultanovih sobanah, je svojega moža prosila, če se lahko pred usmrtitvijo še poslovijo od svoje sestre in on ji je to dovolil. Sestra je Šeherezado prosila, naj pove kakšno zgodbo, da bo dolga noč hitreje minila. Tudi sultan, ki je ležal poleg, je poslušal Šeherezadino prvo zgodbo. Noč je minila in Šeherezada je nehala pripovedovati, čeprav zgodba še ni bila končana. Sultan jo je prosil, naj zgodbo dokonča, vendar ga je ona zavrnila, da ni dovolj časa, saj se zunaj že dani. Sultan je sklenil, da jo bo pustil pri življenju še en dan, da bi lahko dokončala zgodbo naslednjo noč. Toda naslednjo noč, ko je Šeherezada prvo zgodbo končala, je takoj pričela pripovedovati drugo, še bolj zanimivo. Pripovedovanje te druge zgodbe je prav tako prekinila na sredini ob zori naslednjega dne. Šahrijar jo je ponovno pomilostil za en dan, da bi lahko ponoči dokončala pripoved druge zgodbe. Tako si je Šeherezada noč za nočjo podaljševala življenje z vedno novimi zgodbami. Ko je minila tisoč in ena noč in mu je povedala tisoč zgodb,

se je sultan Šahrijar zaljubil v Šeherezado in jo dokončno pomilostil. (povzeto po: Tisoč in ena noč)

Podobno kot je Šeherezada prepletala svoje zgodbe, je Carlo eksperimentalno z natisočimi mišičnimi vlakni živali, ljudi, mladih in starih, športnikov in ostalih in ne nazadnje samega sebe. Vsako vlakno posebej je pod mikroskopom pripravljalo 30-60 minut, da bi lahko nato preveril njegove kontraktilne lastnosti. In vedno je našel čas za še eno ... in še eno ...

Njegovo znanstveno delo je ogromno (več kot 220 znanstvenih člankov, preko 8000 citatov) in ponosni smo, da smo lahko delček njegove akademske kariere. Od leta 2008 dalje smo sodelovali pri pripravi šestih znanstvenih člankov, v katerih smo poročali o rezultatih znanstvenih raziskav pri katerih smo poslušali, se učili, diskutirali in se tudi zabavali.

Primerjali smo učinke 14-dnevne popolne gibalne neaktivnosti v študiji »bed rest« med starejšimi in mlajšimi moškimi in rehabilitacije, ki je temu sledila. Učinek neaktivnosti na mišično maso in funkcionalnost je bil večji pri starejših, medtem ko so bile pri mlajših ugotovljene večje metabolne spremembe. Rehabilitacija po neaktivnosti je bila počasnejša pri starejših moških. Rezultati kažejo na velik klinični pomen skrajševanja period neaktivnosti pri starejših (Pišot, Reggiani, Šimunič, et al. J Appl Physiol, 2016)

Kot smo skupaj dognali, se moramo zavedati, da je potrebno starost kompenzirati in se izogibati obdobjem neaktivnosti.

Dragi Carlo, od tvojih tridesetih let si izgubil 6 kilogramov mišičnih vlaken. Natančno toliko jih je v pršutu, ki ti ga podarjamo. Izguba mišičnih vlaken je večinoma posledica upada dnevne gibalne aktivnosti, kar boš moral nadomestiti in pri tem naj ti bo v pomoč ta športna majica. Za boljšo vadbo boš moral povečati vnos nekaterih karotenov, mineralov in vitaminov, ki so vsi prisotni v tej steklenici oljčnega olja. Kljub temu pa boš moral poskrbeti še za zadostno količino vitamina D in se za to dovolj izpostavljati sončnim žarkom, kar sedaj, ko si v pokoju, ne bi smel biti problem. Kri bo hranila prenašala do tvojih na novo pridobljenih mišičnih vlaken in potrebno bo nekako dopolniti zalogo krvi. Da boš imel v prihodnje dovolj plazme in eritrocitov, boš moral zaužiti ti dve steklenici malvazije in refoška. (iz predstavitve Rada Pišota in Boštjana Šimuniča)

V veliko zadovoljstvo nam je bilo, da je lahko Inštitut za kineziološke raziskave ZRS Koper sodeloval na tej konferenci in hkrati, da si tudi ti del našega Inštituta. Hvala Carlo!

Boštjan Šimunič, Rado Pišot
in ostali člani Inštituta za kineziološke raziskave ZRS Koper