

Growth factors

DR AHMED AL QAHTANI discusses growth factors and their impact on the future of aesthetic medicine



In 1986, Dr Rita Levi-Montalcini and Stanley Cohen were awarded the Nobel Prize in Physiology or Medicine for their discovery of nerve growth factor (NGF). In 2002, Gail Newton and her group—of which Dr Fitzpatrick was one, got the first patent in producing growth factors and using them in aesthetic medicine. We now know them as Chemedica—who were bought out by Arjun in 2014. In 2013, I came up with a patent after having discovered how to produce growth factors, and how to characterise

and generate them. In 2014, I also patented the application of specific types of growth factors for ocular and eye treatments..

What are growth factors?

Growth factors are chemical messengers, which allow the cells to communicate. This is extremely vital for any cellular functions and variability, since cells will not thrive if they cannot communicate with their environment, or with other cells. This is how cells search for help when they need it. If cells are damaged, they communicate

via growth factors to call for help.

Growth factors also have the ability to turn a function on and off. When they were first discovered, proteins were placed in a dish and cells started growing—hence the name growth factors. However, the name 'growth factors', is not really the best name. These particular factors allowed the cells to grow, but we now know that there are more than 370 different growth factors and not all can cause cell growth.

In the same cell, growth factors have the ability to change the



physiology of the cell; they are involved in the production and proliferation of blood vessels, collagen production, distribution, elastin and so forth. When we consider using a platelet derived growth factor (PDGF)—if you want to carry out a function, if you want to construct a product, you can just go to

a growth factor, list functions, and then just pick it out. It is just like cooking a meal.

Growth factors are very unique. They are signalling molecules that require a 'lock and key' and they cannot cross species. If your patients are humans, then you will need to use growth factors that are

derived from humans. If your patients are apples or oranges, then you need growth factors from apples or oranges.

Growth factors for treating necrosis

Dr de Melo is a Portuguese plastic surgeon based in Dubai. He has been using growth factors for the last five years in his practice and has been working on a clinical case that is expected to publish soon.

Clinical evidence #1

A 37-year old female patient was presented to Dr de Melo for a breast reduction operation. She was

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a heavy smoker, so oxygen content in her blood and blood platelets had become sticky and aggregated. After the breast reduction, she returned having developed total necrosis in the areolas of the nipples. A blood surgeon would deal with this by bringing a vessel from below, connecting it up and cutting where the necrotic tissue is.

Knowing this woman did not wish to have more surgical interventions, Dr de Melo's approach was to treat her with 'recovery'—a very high concentration of growth factors designed to repair; hence the name. She came in every three days to change the dressing and after 26 days, the whole nipple and areola was restored.

From my experience, healing and restoring are two different concepts. This woman's wound was healed in 26 days—you would have never known there was a trauma before. Sensation was recovering, showing the nerves were starting to reconnect. Testing nerve sensation can be done not just by sensation, but also by checking reflexes as well—seeing if the nipple shows erectile response after stimulation. That happened at 40 days. The treatment not only restored the tissue, it was also repaired without scarring. Furthermore, function was restored. This amazing communication comes from growth factors.

Improving wound healing—clinical evidence #2

A 62 year old female patient with type 2 diabetes was presented at a clinic in California. She had a very poor medical history. She had lost both her eyes, had a heart problem, and had fallen and injured her knees. After six months of standard and ineffective treatment for chronic wounds, she was open for any new clinical trials of some drugs that could help her. The scar formation was particularly interesting as there was really minimum scar formation. In a 62 year old diabetic patient, you can expect very slow healing and a lot of scarring, but this was not the case.

Growth factors changing orthopaedics

Another area where growth fac-

RECOVERY

The AQ Recovery Serum in conjunction with micro needling works to tighten the skin as the serum targets fibroblast cells that are responsible for providing a backbone for the skin. It has been used by dermatologists, cosmetic surgeons, and even orthopedic surgeons who use it before dressing. This serum is a pharmaceutical grade product containing the highest concentration of natural growth factors, proteoglycans, and glycosaminoglycans on the market. The AQ Recovery Serum is designed to enhance the skin's natural process of regeneration and repair by promoting collagen production, promoting healthy circulation, and encouraging cellular renewal. This system of producing growth factors is easier, more convenient, and even safer than other conventional methods. It improves the appearance of ageing, damaged and post-procedure skin with a highly concentrated formula that transforms skin cells to a younger state and fortifies the skin's ability to repair DNA damage that causes the signs of ageing.

The serum is ideal for post-operative care and post-spa procedures, as well as a wrinkle-reduction agent used in conjunction with skin resurfacing modalities like lasers, chemical peels or dermastamps. It is great after clinical procedures for shortening down time, speed healing and improves end results. This especially applies to post wound care for orthopaedic surgery procedure. The AQ Recovery Serum soothes irritation from bruising after cosmetic procedures, reduces the appearance of broken capillaries, and greatly decreases post-procedural redness.



tors are changing the landscape of scarring is in orthopaedics. Females who undergo knee surgeries often dislike the scarring that comes after it, so surgeons have trialled something new using growth factors. After inserting the pin, 'recovery' is applied on top of it—which is really the growth factors.

It is now possible for women to feel confident while wearing a skirt

after knee replacement surgery, so it has become really a model for advertising. No scar formation, quick healing and fast recovery keeps patients satisfied.

Combining growth factor with micro-needling

Now, combining micro-needling with growth factors has been certified in the USA as a treatment. It is difficult to get the growth factor



THE IMPORTANCE OF SKINCARE IN CLINICS

Many procedural doctors are not focused on skincare and underestimate the importance of skincare in their clinics.

Skincare gives an easy income and can support a clinic, but it cannot be just any old skincare—it is vital to be strategic. A patient visiting a doctor or a professional can expect a scientific based product that is scientifically sound and has copious amounts of scientific basis.

Simultaneously, the product has to carry an intellectual property and contain an IP patent. It is madness to compete with pharmacies outside of your clinic because if patients can select, more people would choose a pharmacy over your clinic. Therefore, you need to have something that is scientific and has intellectual property, so nobody can duplicate or have another similar line, with the same ingredients.

Look for a product that has been manufactured with GMP—which is good manufacturing practices. You will be surprised to hear that 90% of the products are produced in a manufacturing process where there is an absence of control. If you are going to give something to a patient, be sure that these products are being manufactured with good manufacturing practices.

If you cannot sell the product to a patient, you can use it in your therapies. If you use laser, IPL or any other therapeutic procedures, you can use this product to enhance your results. Products that can be combined with clinical procedures will give you an income, and can be used in combination with a therapy—for example 'recovery' is specifically for a professional; the patient cannot access it. It is only sold to doctors and professionals, but they can use it with their separate treatments so it acts as another income for them. Look for a product that is strictly dispensed for physicians.

through the tissue, so a modality to get that growth factor in is needed. After using micro-needling and growth factors, staining and biopsy can be used to see if growth factors are delivered.

Treating hair

A paper published in 2011 by Global Penn State found that PDGF stimulates the stem cells around the papilla of the hair and promotes hair growth. I can testify to this because I did the treatment in 2010 and I still have my hair.

Hair growth case study

Growth factors are signalling molecules, so the growth factor found in the recovery is different from the growth factor that is used for hair growth. With an aim to discover what growth factor combination could communicate with the targeted hair cells, I was involved with research that was carried out on a mouse head. The mouse was shaved, and growth factor was applied to one side and water was applied to the other side. Like hair, fur is different, but we followed up to see whether there was growth. We

Dr Paola Sjoqvist, Oslo, Norway, performing growth factor induce therapy for rejuvenation

knew that both sides were going to grow, but wanted to see if the communication message that we sent is actually getting there. After 21 days the side with the growth factor grew almost 45% faster “than the normal hair”. This shows that the growth factors we chose “for this purpose” are actually communicating with the papilla.

Using a device with specific software that measures the area and the new hair that grows, the number of hairs being produced was calculated, alongside the coverage. Although we are concerned with how much hair is growing, since we are interested in the aesthetic, it is also necessary to know how it is going to cover. The correct distribution is important, and 2,000 follicles transplanted all onto one side of the head will not work.

Dr Paola Sjoqvist, Oslo, Norway, performing growth factor induce therapy for rejuvenation

Safety

There is no research to date to indicate that growth factors are bad. Growth factors are found naturally in the human body and often times, growth factors are not like hormones; they do not have negative reactions. Applying growth factors does not mean the body will stop producing them. Usually, there is no receptor in the cells to take the growth factor—it just gets disseminated. Growth factors mostly act locally and trigger cell receptors. Once they go in, they only attach to the receptors, so they are untraceable in the blood stream. Usually the by-product, or breakdown of the growth factor, will have side effects. In this case, the body is used to dealing with growth factors so there will not be any breakdown or by-product of them. They are also safe enough for the US FDA

to allow growth factors to be used in cosmetics.

Dr Ahmed Al Qahtani is a National Institutes of Health (NIH) scientist for numerous NIH grants in research and development. He is accredited with numerous scientific publications. A longstanding member of the American Association of Immunologists, Dr Al-Qahtani has spoken and presented research at congresses around the world. He started AQ Skin Solutions through extensive work in the medical applications of growth factors for healing wounded tissue and creating artificial skin grafts. As a researcher in immunology, he applied his knowledge and experience in GF biotechnology to develop a process for producing the highest quality GF media available, which contains growth factors that have been identified to be the most effective for rejuvenating skin.

