

SKIN CARE IN 2015

I believe skin care is going to radically change in the next ten years. More and more people are going to realise the value of scientific skin care and the market will grow exponentially.

Currently there are a number of delusions about skin care.

1. People are lead to believe that the more expensive a product is the better it is.
2. The public is persuaded that botanical skin care is safer and more effective than “chemical” skin care,
3. Beautiful advertising works
4. Famous people are used to endorse products
5. Pubic opinion is swayed by fears spread by the internet concerning the safety of various “chemicals” used in skin care.
6. Paradoxically people believe nothing penetrates the skin effectively.
7. People believe that the higher the SPF, the safer they are.

In the next ten years the general public will start to demand more effective products for their money. They will also understand that plants naturally contain not only good, useful molecules but also toxins. Unrefined extracts of plants may even concentrate these toxins. Few people today recognise that very many vegetables and fruits contain parabens naturally and therefore every botanical product contains parabens. The informed public will search for products with refined or synthesised ingredients in preference to botanicals. An excellent example is synthetic vitamin C (l-ascorbic acid) which is natural vitamin C and can be used in high concentrations which can never be achieved with botanical ingredients.

The current anxiety spread by the internet about certain chemicals causing cancers etc. will become less as people come to understand something Paracelsus stated several hundred years ago: there are no poisons, only poisonous doses. On the other hand there are no safe chemical, only safe doses. A good example is Sodium Borate (teething powder) which is safe but give enough of it and it's a poison.

Millions of dollars are spent in making people believe the myth that the latest magic ingredients will remove wrinkles, pigmentation and acne in no time. The only effective thing is the financial plan. People flock to buy a product because some famous person tell us they use it. .No-one questions the authority of the famous name ...what is the reason for this validation. Money?

In the skin care industry today the marketing and design departments plan products according to fashion and order chemists to make products of certain characteristics. I believe skincare in the future will be designed by chemists and then Marketing will develop the sales plan.

What changes will chemists introduce? Skin care of the future will have ingredients that read like medicines to deal with the damage caused by sunlight which affects everyone from Japan in the East to America in the west. The chemicals in skin that are destroyed by light need to be replaced and predominant amongst them is vitamin A (and especially retinyl palmitate) which naturally protects the skin from UV damage, controls DNA activity, normalises cells, induces cellular growth and maturation, collagen and elastin deposition and normalises skin colour. Eventually every skincare company in the world will use vitamin A and anti-oxidants plus all other molecules that are destroyed by exposure to light.

By 2015 when the average life expectancy may be 83 years there will be many people who will live over 100 years and those people will need healthier younger skin. This future skin care will have to promote and protect elastin and collagen. This is where peptides are going to become more and more important. Skin care starts with sensible sun care.

Virtually all organic sunscreens are inactivated by exposure to light and can be absorbed into the skin where they could become free radicals and aggravate the free radical insult from sunlight. That has to change and all sunscreens have to become more stable and contain a broad spectrum of antioxidants. In particular we need more effective UV-A protection. UV-A damages by free radical formation mainly so antioxidants have to be an essential part of future sun-care. We will see more inorganic components to sun care e.g. titanium oxide and zinc oxide. The problem with zinc oxide is that it reacts with Vitamin C and other antioxidants so you cannot have good antioxidant protection if you use zinc oxide.

We have to make enough vitamin D to prevent cancers and osteoporosis! Sunscreens in the future will have lower SPF values in compliance with scientists who believe that we should not be using higher than SPF 20.

SPF claims higher than 30 will not be permitted. Do you think companies are going to produce SPF 60 into a cream when they can only declare 30 +? They will put SPF 31 into it only because of the marketing value of the +. I see skincare of the future everything will be reduced to a more sensible level, and skincare companies will be competing on their effects rather than on their marketing.

Better UV-A protection will help us to treat pigmentation and maybe by 2015 we will be able to treat melasma in 3 months Fortunately with some of the new ingredients (“chemicals” and highly refined plant extracts) we can already make a significant difference but I think by 2015 I believe we will be even more successful.

These creams of the future will be laden with active ingredients but we are going to have to get them through into the areas that we want them to work. Enhanced penetration is going to become an integral part of skincare. Your role as skincare advisors will be to guide people into ways of how they can get more out of their cream. Generally average creams have more or less 1% effect, but we need the active ingredients at higher doses which means they need to be formulated to penetrate better. But that is not enough and that’s why instruments like Cosmetic Roll-Cit, iontophoresis and low frequency sonophoresis will become an important part of skin care.

What are the special ingredients that we will find in 2015?

Vitamin A

Vitamin A has to be used, and the same goes for anti-oxidants. We will want to have as many anti-oxidants as possible not just one “latest and greatest” anti-oxidant. You may be introduced to unusual words in this article that are going to become ordinary words because they are part of what you will do in the future.

The reason why vitamin A has to be there is because it keeps the DNA of the keratinocytes, the melanocytes, Langerhans cells and fibroblasts in a normal state. However, vitamin A is not an easy molecule to work with because the people who most need it are the people who will react to it and get a retinoid reaction. Therefore creams of the future will have to be able to control the retinoid reaction. Intensive study shows that the retinoid reaction is similar to a simple chemical irritation so we may be able to control it by 2015. Once we can control the retinoid reaction vitamin A can appear even in over the counter creams.

Another problem about Vitamin A is that it may cause an acne breakout even though it is an essential part of treating acne. The future creams will have to overcome this side-effect.

Some people claim that Vitamin A makes your skin thinner, well that's not true. Some people stop using Vitamin A in summer because they believe it is dangerous to use it and to go out in the sun - they only used it in winter. Retinol and retinoic acid are photo-sensitizers, but retinyl palmitate protects us. Vitamin A is difficult to work with and that is why your work as a skin therapist will become even more recognised as you successfully guide people onto using it correctly.

Antioxidants

Our skin gets attacked by more free-radicals than any other organ. That is why we have to use anti-oxidants. First of all we need vitamin C, which every skin care product of the future has to contain. No other anti-oxidant can replace it in

making collagen. As an anti-oxidant it covers water soluble free radicals and paradoxically converts used-up vitamin E radicals back into active vitamin E. Vitamin C, vitamin E, Alpha lipoic acid, Co-enzyme Q-10 and glutathione are the network antioxidants that re-cycle each other. They are promoted by carotenoids. If you supply only two of them then you will increase all the other components of the network. Co-enzyme Q-10 is expensive, alpha lipoic acid smells and is difficult to make fine quality creams, and glutathione cannot be found outside a cell so at least every cream of the future will have to have vitamin C and E plus some carotenoids. Vitamin C is not stable and is not easily absorbed into skin cells. It should therefore be included as stable, long lasting forms that are easily absorbed into cells.

The biggest marketing in the future will concentrate on various added antioxidants that will be fashion driven. Last year it was pomegranate, now it's white tea (a type of green tea). I believe however certain ingredients will be even more common in skin care: green tea is a wonderful ingredient and besides being an anti-oxidant it resuscitates cells that have been damaged by sunlight and protects us from cancer. Green Rooibos tea, green Honeybush are powerful antioxidants which have specific application in sun-damage and the treatment of melasma.

Ubiquinol is an excellent anti-oxidant that works in the mitochondria (little organelles inside the cell that create energy). Generating energy creates free-radicals in the mitochondria which damage the mitochondria, so we need to protect the mitochondrion. Co-Enzyme Q-10 and alpha lipoic acid also help to protect mitochondria.

We need water soluble anti-oxidants, lipid-soluble anti-oxidants, as well as methods to deal with nitrogen based free-radicals and also carbonyl free radicals. So manufacturers will have to choose which free radical scavengers they will include. We will see lots of claims of superiority but if they are addressing the four different types of radicals, they probably will all do equally well, but with different chemicals.

We have to realise that anti-oxidants cannot really rejuvenate skin - they help to prevent ageing, so if you start using them today, you will slow down ageing but you cannot reverse ageing - that's why we will always need Vitamin A. The same thing goes with pigmentation: anti-oxidants make it difficult to produce melanin, but can't really help treat established melasma. Vitamin C has a limited value because it is also a weak tyrosinase inhibitor. You get some lighting, but you don't get removal of pigmentation.

Peptides

Peptides are a collection of amino acids that are the building blocks for proteins which contain hundreds and thousands of amino-acids. Insulin is a peptide but the peptides we are interested in are a select few amino-acids that have special messenger functions between skin cells. Dipeptides are two amino-acids joined together, tripeptides are three and pentapeptides have five amino-acids together. These peptides will be classed in different groups according to the type of amino acids in them and despite similar names may have different properties (e.g. pentapeptide-3 may be Vialox® or Leuphasil® which have very different actions). This is all confusing and I believe a more exact nomenclature will be necessary by 2015. Peptides work by sending messages from one cell to the other e.g. to the fibroblast to make more collagen, Of course not all peptides work. Some peptides may be very large and cannot penetrate skin unless one uses Cosmetic Roll-Cit or low frequency sonophoresis.

The skin has a system of enzymes on it that destroy peptides so the formulations will have to protect peptides.

Growth Factors

Growth factors are quite different from peptides and may become an important part of our 2015 skincare. There are very many growth factors produced by keratinocytes for healthy skin e.g. EGF (Epidermal growth factor), and TGF (Transforming growth factors). Melanocyte stimulating hormone (MSH) induces pigment formation, ACTH is also released from keratinocytes and may be

involved in post inflammatory hyper-pigmentation. Fibroblasts produce growth factors that stimulate keratinocytes so there is a very complex interaction of growth factors. It is further complicated by the fact that they have different effects e.g. EGF promotes cell growth whereas as TGF inhibits growth but they are both required for healthy growth. Fortunately these growth factors are largely controlled by vitamin A which maintains a healthy balance.

Skincare of the future must help skin last longer because there are going to be more older people. Look at it this way, if you want the skin that you have at 30 to last a lot longer than the current trend then start intensive treatments now before you need it and then you will have the skin of a fifty year old when you are 100

Chromosomes, telomeres and telomerase

How are we going to make skin last longer? The clue lies in the DNA. In every cell we carry 46 pairs of chromosomes. Unfortunately as we age our chromosomes get shorter. Part of the problem is caused by free radicals attacking the DNA. Chromosomes have an X shape (the “legs” are called telomeres). Our new-age creams have to protect the telomeres from shortening because when they shorten they become dysfunctional as in the typical keratoses seen in older people. Eventually the telomeres are so short the cells stop working. A good example of this I have heard, was Elizabeth the Queen Mother of England who died because her blood making cells stopped working at 101 years.

We have an inbuilt system to try and keep cells functional. That is an enzyme called telomerase which helps to build up the telomeres. Telomerase is common in young cells and in cells that have to divide a lot e.g. bowel, blood and skin cells. As we get older, our levels of telomerase drop. You’d expect telomerase to become part of skin care for the future but it’s not that simple: cancer cells are rich in telomerase so would we promote cancer by giving telomerase?

Fortunately we have one amazing ingredient that safely helps to build up telomerase in normal cells and reduces it’s activity in cancerous cells: vitamin A!

Studies showed that by adding extra doses of Vitamin A to skin cultures, those skin cells live up to 1.8 times longer than ordinary skin cells with standard vitamin A nutrition. We can also protect our telomeres by enriching cells with antioxidants to make them live longer. Studies using vitamin C precursors showed that cells could live up to 150% longer but vitamin C itself could not do this because it is not absorbed into the cell

At this stage it is safer and natural to use Vitamin A, to keep that balance of growth factors and produce telomerase naturally and protect the telomeres with antioxidants.

Enhanced Penetration Techniques.

Cosmetic Roll-Cit has opened up the skin to safe enhanced penetration because it creates transient holes through which the applied products easily filter into the deeper parts of the skin and I believe in the future everyone caring for their skin will use this tool.

We already have iontophoresis but unfortunately it is being used non-scientifically by many people who think of it as only a current that they apply instead of a scientific method to drive molecules into the skin. Pulsed iontophoresis is safer and more effective than simple galvanic current and I believe that professional treatments in the future will dispense with high frequency machines and concentrate on real delivery.

Low Frequency sonophoresis only was discovered in the 1990's and the research was ignored in the beginning because the results were outrageous. The scientific world has now accepted that low frequency enhances skin penetration up to 4000 %. Roll-Cit may equal or even exceed its effects depending on the time spent rolling: 5 -10 seconds will not help at all whereas 3 to 4 minute will enhance penetration up to 10,000 times.

In summary

As we understand better what the skin needs to stay healthy despite going into the sun, we will be able to formulate highly targeted products. One has to realise this means that the basic formula will not change much over time and we will not see new creams coming out every few weeks, as seems to happen right now. However, different types of anti-oxidants are going to be like the little fluttering marketing butterflies around the basic formula. All the skincare of the future is going to have Vitamin A, anti-oxidants, **peptides**, growth factors and other molecules to stimulate collagen, elastin and preserve the chromosomes. Our sunscreens will be stable and we are going to use enhanced penetration methods.

I believe skin care professionals are lucky because they have a rapidly expanding market with more and more people who are informed about keeping their skin healthy.