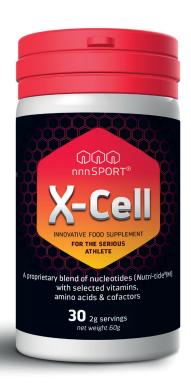




Sport nutrition's best kept secret

nnnSPORT®X-Cell® harnessing nucleotide power



As the building blocks of DNA and the backbone of cellular regeneration, nucleotides are essential to the foundation of good health, sports performance and recovery.

Incorporating our ground-breaking, proprietary Nucleotide formula: *Nutri-*tide®, nnnSPORT®X-Cell supports the enhanced cellular regeneration requirements of the serious athlete

- For protocols that recognise that cellular regeneration is the key to elite sporting performance.
- Water-soluble scoop servings enabling therapeutic dose treatments dictated by training and stress levels.
- Nutri-tide® nucleotide nutrition delivers a balanced level of all five nucleotides pyrimidine & purine.
 A sophisticated proprietary blend of purified nucleotides that are readily absorbed in the intestines, it should not be confused with basic yeast RNA products.
- Nutri-tide® nucleotide nutrition formula is blended with selected vitamins and amino acids enhancing immune and digestive health, and improving energy and recovery, whilst reducing the effects of high intensity and endurance stress. and is ideal for use in combination with existing training regimens.
- Nucleotides extracted from food sources using non-solvent quality assured techniques and tested for WADA
 prohibited substances. nnnSPORT®X-Cell is registered with the Informed-Sport testing scheme.
- nnnSPORT®X-Cell acts like a "supplement enhancer" when included in an athletes protocol
- Caters for pyrimidine and purine food deficiencies
- Extracted from food sources and suitable for vegans, vegetarian, Kosher and Halal diets
- Purified and quality tested to be gluten, yeast, and lactose free



The essential nature of nucleotides

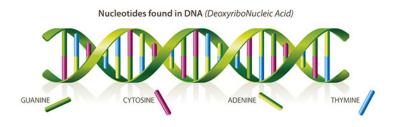


Nucleotides are primordial micro-nutrients and are the key nutrients essential to many biological processes

Nucleotides are the building blocks that form DNA and RNA.
 The 5 essential DNA and RNA nucleotides are:



• Over a billion nucleotides are required to build a human DNA helix.





• Certain cells are dependent on dietary nucleotides for cellular regeneration i.e. DNA replication

Immune function:

Lymphocyte & macrophage cells – their rapid proliferation place a high demand on nucleotides availability.

Energy & Recovery; Oxygenated blood:

Erythrocyte cells – unable to produce their own nucleotides.

Intestinal mucosa growth & repair processes:

Epithelial cells – own-production is too low to cover their needs.

Intestinal flora:

bifidobacteria - unable to produce their own nucleotides.



• Nucleotides supplied through the diet indirectly support other organs and metabolic processes:



Liver function:

Supplementary nucleotides lower the threshold for stress by providing a direct source that bypasses the liver (see High Intensity Sports Stress research).

Protein synthesis:

RNA is essential for the formation of protein. Insufficient dietary intake of certain nucleotides* reduces the ability of the liver to produce protein, and where liver function is impaired then the storing of fat is favoured. *Cytidine, Uridine, and Tymidine – the pyrimidine nucleotides (see Quality of meat animal production research).

Impact of Stress:

The body uses nucleotides to repair DNA damaged by oxidative stress. Repaired cells can then regenerate normally. (see Oxidative Stress research).

Additionally, high levels of stress decrease liver function and produce excess stress hormones, such as cortisol, that restrict cell regeneration. Dietary supplementation helps to lower the threshold for stress by providing a direct source of nucleotides that bypasses the liver.

Energy metabolism:

The transport of oxygen is dependent on the number of red blood cells in the body. New, highly oxygenated blood cells supply oxygen to muscle cells. Muscles stay in the aerobic phase, thus utilizing readily available energy to its full extent, producing less lactate. Resulting in shorter recovery periods and fewer muscle cramps after strenuous exercise.

In repeated intense exercise there is a loss of energy, namely ATP – the nucleotide Adenosine Tri-Phosphate – from muscles. Supplementary adenosine replenishes the muscles' nucleotide pools.

 Nucleotides and their derivatives serve diverse roles in enzymatic regulations, signal transduction and as structural components of coenzymes.

nnnSPORT®X-Cell - additional information

History of safe use - no adverse effects

- Mother's breast milk and commercial infant formula.
- Food supplements for the serious athlete: nnnSPORT®X-Cell is registered with the Informed-Sport testing scheme for the additional assurance required by the serious athlete.



- Consumer food supplements; Nutri-tide® nucleotide nutritional formula is a key component of the consumer food supplements IntestAid®IB (digestive health) and NuCell®IM (immune health). These supplements have been safely used by consumers since 2004.
- Health practitioner supplement: *Nutri*-tide®NT, which supplies more therapeutic levels of the *Nutri*-tide®IM formula, under the direction of a health practitioner.

Caters for dietary deficiency

- Changes in dietary habits Modern Western diets result in less nucleotide-dense foods (refer to Swiss food studies)
 e.g. offal, bone marrow.
- Overcomes modern "depleters" of nucleotide reserves e.g. high intensity training, performance stress and poor immune function.



^{*} For more information about nucleotides see "P7. Reference Material".

nnnSPORT®X-Cell – Interim scientific studies results



A message from Rachel Hoyle – CEO, Nucleotide Nutrition Ltd

Dear Sports Nutrition & Exercise Professionals,

it's a decade now since the publication of our first sports exercise clinical study focussing on high intensity stress.

10 years on and 2016 marks the publication of our latest study testing athletes taking our unique nucleotide supplement, nnnSPORT®X-Cell, under a resistance stress exercise regime.

We feel, therefore, that this is the perfect time for us to release an overview of our research into nucleotide supplementation in the field of sport and exercise.

Coinciding with the release of our latest results Dr Peter Koeppel, the pioneer of nucleotide supplementation for athletes, was invited to speak at this years' Sports Nutrition LIVE event about the Effects of Nucleotides on the Performance and Health of Athletes*.

Back in the "noughties", following internal research into the nucleotide content of different foods, Dr Koeppel, with his Swiss company ProBIO AG, established Nutri-tide®, a proprietary formula containing a scientific balance of all 5 of the main dietary DNA and RNA nucleotides, the composition of which was designed to overcome dietary deficiencies and intensive stress conditions. The collaboration between Peter Koeppel and Nucleotide Nutrition Ltd found UK grant funding for investigative clinical trials to test these nucleotide supplement formulations ... and with such significant results emerging we have never looked back!

Now, 10 years later, we are extremely proud to share this overview of those findings with you, the UK's foremost-thinking exercise practitioners and professionals,

Research and quality are of the utmost importance to Nucleotide Nutrition Ltd and ProBIO AG, which is why all of our products are formulated using natural and pure ingredients and are produced under strict quality control protocols. You can be assured too that nnnSPORT®X-Cell is safe to use and free of prohibited substances since it is registered with the Informed-Sport testing scheme.

We hope you enjoy the following overview of our research supporting the latest advance in functional sports nutrition.

Rachel Hoyle, BSc

* Lecture summary, Dr Peter Koeppel: Effects of nucleotides on performance & health of athletes

Exercise can have both positive and negative effects on the immune function and the susceptibility to minor illnesses. Dietary nucleotides can improve the relationship between exercise, the immune system and host protection. The transport of energy in the body is fully dependent on the availability of nucleotides in the form of ATP, GTP and UTP. Nucleotides also support oxygen supply to the body, meaning potentially diminished lactate levels in athletes.

Studies show that supplementary nucleotides repair DNA that have been damaged by increased levels of oxygen radicals, reduce muscle damage after intensive exercise, and support the absorption of nutrients in the gut by improving gut morphology.



Athletic benefits from nucleotide supplementation

1. Improved Immune status as shown by salivary antibodies (IgA)



† Our product, nnnSPORT®X-Cell, shares the same base formulation as our immunity product, NuCell®IM, used in the above research studies

McNaughton et al, Moderate endurance exercise, 2006

Salivary immunoglobin (IgA) is the main form of immunoglobin found in saliva and the mucosal membranes, thus it plays a front line role in defending the body against colds and other respiratory infections.

It is a readily measured marker for immune system function.

After 60 days of supplementation, using a moderate dose (1500mg), significant differences were found between the control* and the experimental groups following moderate endurance exercise.

Those taking the nucleotide supplement had significantly higher levels of salivary IgA than the control group.

 * The placebo (control) contained the same level and content of vitamins and carrier as found in our nucleotide supplement.

Please note:





Athletic benefits from nucleotide supplementation

2. Improved Immune status as shown by salivary antibodies (IgA)



[†] Our product, nnnSPORT®X-Cell, shares the same base formulation as our immunity product, NuCell®IM, used in the above research studies

McNaughton et al, High intensity stress exercise, 2007

The impact of nucleotide supplementation was repeated by McNaughton, this time using high intensity stress exercise.

As in the 2006 trial, after 60 days of supplementation, and using the same moderate dose (1500mg), significant differences were once more found between the control* and the experimental.

Those taking the nucleotide supplement had significantly higher (20%) levels of salivary IgA than the control group.

The implications are that nucleotide supplementation strengthens the immune system, leading to fewer colds and upper respiratory tract infections (URTI).

This impact on URTI's was observed in a colds study at Queen Margaret University, Edinburgh (due for publication Autumn 2016.

Please note:



^{*} The placebo (control) contained the same level and content of vitamins and carrier as found in our nucleotide supplement.



Athletic benefits from nucleotide supplementation

3. Reduced immune suppression as shown by cortisol



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McNaughton et al, Moderate endurance exercise, 2006

Cortisol is a hormone released when the body is under stress. While it is normal for an athlete to have a higher level of cortisol after exercise, elevated levels indicate higher stress. All things being equal, an athlete with a lower level of cortisol post-exercise will have a faster recovery, since there is less catabolism [tissue degradation] during exercise.

After 60 days of supplementation, significant differences were found. Cortisol was significantly (p<0.02) lower after exercise compared with Placebo group following moderate endurance exercise. Those taking the nucleotide supplement had significantly lower build-up of cortisol.

Additionally, this trial shows that significant benefits can be achieved for relatively low doses of the nucleotide formula (1500g) when longer loading periods are used, in this case, 60 days.

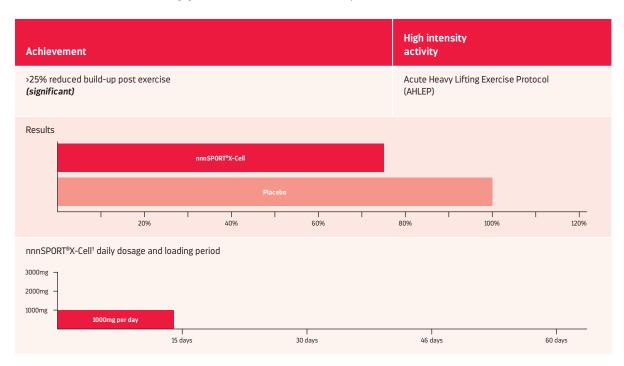
Please note:





Athletic benefits from nucleotide supplementation

4. Reduced immune suppression as shown by cortisol



Sterczala et al, Resistance exercise stress. 2016

In a new trial the cortisol levels were analysed in a double blind, placebo controlled, cross-over test after an acute heavy resistance exercise.

Ten male athletes underwent two supplementation and testing cycles, which were separated by a one-week washout period.

The results are quite striking. The cortisol level at 15 and 30 minutes were significantly lower in the supplemented group. Whereas the cortisol levels in nucleotide supplemented athletes remained on the same level, a significant increase could be observed in the placebo group period up till 60 minutes after the exercise.

This clearly confirms the earlier results of McNaughton. It also shows that for this type of exercise moderate levels of supplementation (1000mg) can reduce the build-up of this stress hormone with even shorter loading periods.

Please note:





Athletic benefits from nucleotide supplementation

5. Improved cardiovascular function as shown by reduced heart rate



 $\ \, \uparrow \ \, \text{Our product, nnnSPORT} \text{^eX-Cell, shares the same base formulation as our immunity product, NuCell} \text{^eIM, used in the above research studies}$

Independent university research** (On-going)

The findings from this small-scale trial indicate that, in thermos-positive conditions (\sim 30°c), 90 minutes of soccer-specific intermittent exercise (SSITP) shows a statistically significant (P<0.05) positive influence by nucleotide supplementation, where cardiovascular function was improved at the same work rates, with the no. of heart beats reduced by 10 beats per minute.

†† To be published

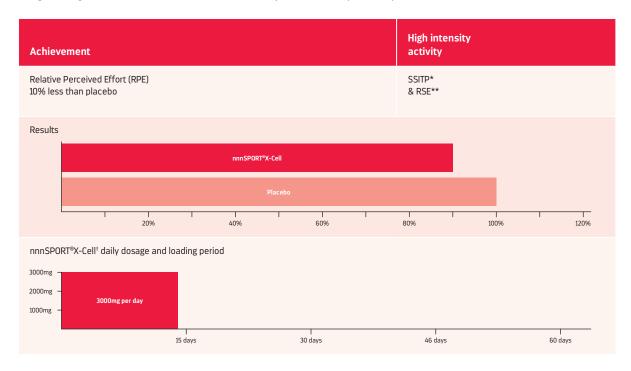
Please note:





Athletic benefits from nucleotide supplementation

6. Impact performance as shown by relative perceptions of effort (RPE)



^{*} Soccer Specific Intermittent Treadmill Protocol (SSITP)

Independent university research^{††} (On-going)

The findings from this small-scale trial indicate that, in thermos-positive conditions (~30°c), 90 minutes of soccer-specific intermittent exercise (SSITP) shows a statistically significant (P<0.05) positive influence by nucleotide supplementation, over the placebo group.

Subjective perceptions of effort (RPE) relating to these intensive exercises were reduced by over 10%.

tt To be published

Please note:



^{**} Repeat Sprint Exercise (RSE) – 6 x 35m maximal sprints interspersed with 15 second active recovery

[†] Our product, nnnSPORT®X-Cell, shares the same base formulation as our immunity product, NuCell®IM, used in the above research studies



Athletic benefits from nucleotide supplementation

7. Reduced impact on recovery as shown by blood lactate responses



^{**} Repeat Sprint Exercise (RSE) – 6 x 35m maximal sprints interspersed with 15 second active recovery

Independent university research*** (On-going)

Subjects performed a repeated sprint exercise (RSE) ability test consisting of $6 \times 35 \text{m}$ maximal sprints interspersed with a 15 second active recovery to return to the start line.

After a short loading period 14 days, but using a relatively high dose (3000mg) there was a significantly lower blood lactate response (23%) compared with the placebo*.

Nucleotide supplementation mediated reductions in blood lactate responses, and improvement in sprint performance times and reduce perceptions of effort were observed.

* The placebo (control) contained the same level and content of vitamins and carrier as found in our nucleotide supplement.

tt To be published

Please note:



[†] Our product, nnnSPORT®X-Cell, shares the same base formulation as our immunity product, NuCell®IM, used in the above research studies



Athletic benefits from nucleotide supplementation

8. Reduced impact on recovery as shown by blood lactate responses



[†] Our product, nnnSPORT®X-Cell, shares the same base formulation as our immunity product, NuCell®IM, used in the above research studies

McNaughton et al, Moderate endurance exercise, 2006

This ground breaking trial showed the impact of nucleotide supplementation on recovery following moderate endurance exercise.

Using a moderate dose (1500mg) over a loading period of six weeks a significant impact on blood lactate was observed.

After exercise, change (or build-up) in the level of lactate in the blood was diminished by 25% compared to the control*.

The transport of oxygen is dependent on the number of red blood cells in the body. The ready supply of dietary nucleotides is essential to this cellular generation.

The new, highly-oxygenated blood cells supply oxygen to muscle cells. The longer muscles stay in the aerobic phase, utilizing readily-available energy to a fuller extent, the less lactate is produced.

Please note:



The placebo (control) contained the same level and content of vitamins and carrier as found in our nucleotide supplement.



Athletic benefits from nucleotide supplementation

9. Impact on performance as shown by average sprint times



^{**} Repeat Sprint Exercise (RSE) – 6 x 35m maximal sprints interspersed with 15 second active recovery

Independent university research* (On-going)

Athletes performed a repeated sprint exercise (RSE) ability test, which consisted of 6×35 m maximal sprints interspersed with a 15 second active recovery to return to the start line.

A higher dose of the nucleotide supplement (3000mg) was used over the short 2 week loading period, and this produced a significant difference in average sprint times, 6.60 seconds for the nucleotide group compared with 7.06 for the controls.

tt To be published

Please note:



[†] Our product, nnnSPORT®X-Cell, shares the same base formulation as our immunity product, NuCell®IM, used in the above research studies



Athletic benefits from nucleotide supplementation

10. Impact on performance as shown by peak force (Isometric force recovery)



† Our product, nnnSPORT®X-Cell, shares the same base formulation as our immunity product, NuCell®IM, used in the above research studies

Sterczala et al, Resistance exercise stress. 2016

In this recently published trial the peak force levels were analysed in a double blind, placebo-controlled, cross-over test after an acute heavy resistance exercise.

Ten male athletes underwent two supplementation and testing cycles, which were separated by a one-week washout period.

The most important outcome of this study is that nucleotide supplementation increased the peak force in the back squat isometric force test immediately after the exercise and at 24 hrs, 48 hrs and 72 hrs.

The isometric force in supplemented athletes did not change after an acute heavy resistance exercise, whereas in not-supplemented athletes the peak force was significantly reduced and they required 48 hours for full recovery.

Please note:





Athletic benefits from nucleotide supplementation

Results overview from interim independent scientific studies

Benefit	Effect measured	Achievement	High intensity activity	Trial reference	nnnSPORT®X-Cell† daily dose & pre-exercise loading times
Improved immune status	Salivary antibodies (IgA)	10% higher than placebo (significant)	90 min. cycle ergometer (60%V0 _{2max})	McNaughton et al Mod. endurance exercise. 2006	1,500mg 60 days loading period
		20% higher than placebo (significant)	2 min. maximal exercise ergometer	McNaughton et al High intensity stress exercise. 2007	1,500mg 60 days loading period
Reduced immune suppression	Cortisol	10% less build-up post exercise (significant)	90 min. cycle ergometer (60%V0 _{2max})	McNaughton et al Mod. endurance exercise. 2006	1,500mg 60 days loading period
		>25% reduced build-up post exercise (significant)	Acute Heavy Lifting Exercise Protocol (AHLEP)	Sterczala et al, Resistance exercise stress. 2016.	1,000mg 14 days loading period
Improved cardiovascular function	Reduced heart rate	164 beats c.f. 174 beats (placebo)	SSITP*	Independent University research (on-going)	3,000mg 14 days loading period
Reduced perceptions of effort	Relative Perceived Effort (RPE)	10% less than placebo	SSITP* & RSE**	Independent University research (on-going)	3,000mg 14 days loading period
Reduced impact on recovery	Blood lactate responses	23% lower than placebo (significant)	RSE**	Independent University research (on-going)	3,000mg 14 days loading period
		25% lower 'change in lactate' (near significance)	90 min. cycle ergometer (60%V0 _{2max})	McNaughton et al Mod. endurance exercise. 2006	1,500mg 60 days loading period
Impact on performance	Average sprint times	Notably improved times: Placebo 7.06 secs. vs NuCell®IM 6.60 secs.	RSE**	Independent University research (on-going)	3,000mg 14 days loading period
	Peak Force (Isometric force recovery)	Maintained on same level as before exercise. Placebo group level dropped (>30% lower for 48 hours) (Significant)	Acute Heavy Lifting Exercise Protocol (AHLEP)	Sterczała et al, Resistance exercise stress. 2016.	1,000mg 14 days loading period

^{*} Soccer Specific Intermittent Treadmill Protocol (SSITP)

Please note:



^{**} Repeat Sprint Exercise (RSE) – 6 x 35m maximal sprints interspersed with 15 second active recovery

[†] Our product, nnnSPORT®X-Cell, shares the same base formulation as our immunity product, NuCell®IM, used in the above research studies







Product information

Product Presentation

- Product code: NSXC-001
- Security sealed plastic 100ml pot
- Plastic scoop
- Filled with 60g cream coloured water soluble powder

Ingredients

Inositol, Standardised 5'-Ribonucleotides, L-Lysine, Fructooligosaccharides, L-Ascorbic Acid, Sodium Citrate, Maltodextrin, DL-Alpha Tocopherol, Calcium D-Pantothenate, Folate (Quatrefolic®), D-Biotin, Cyanocobalamin.

Nutritional facts:

per 2	per 2g serving				
(2 x leve	el scoops)	%NRV*			
Vitamins & Cofactors					
Vitamin C (as L-ascorbic acid)	112.2 mg	140.0 %			
Folate (as 5MTHF-glucosamine)	240.0 µg	120.0%			
Pantothenic acid					
(as calcium d-panotothenate)	7.2 mg	120.0%			
Biotin (as d-biotin)	70.0 µg	140.0%			
Vitamin E					
(as d-alpha-tocopherol)	16.8 mg TE	140.0%			
Vitamin B12					
(as cyanocobalamin)	3.0 µg	120.0%			
Inositol	732.0 mg	-			
Nucleotides					
Purified yeast extracts					
of standardised					
5'-ribonucleotides					
pyrimidine & purine) /RNA	540.0 mg	_			
	2 .0.06				
Amino Acids					
L-Lysine	300.0 mg	-			

^{*}NRV = Nutritional Reference Value

Recommended daily dosage

1 level scoop delivers 1000mg

Each pot has 60 x 1000mg scoops providing 30 maintenance servings

Maintenance serving: 2 level scoops per day (2000 mg/day)

Therapeutic serving: 3 level scoops per day (3000 mg/day)

An additional one or two scoops can be taken before, during or after periods of intense training or as directed by a practitioner / trainer.

nnnSPORT®X-Cell can be taken in combination with existing nutritional training regimens.

Powder is water soluble. Dilute in water*, juice, or add to a smoothie or your favourite health drink / protein shake.

*Water is cloudy at first, but becomes clear upon stirring or adding warm water.

/cont.









Product information (cont)

Quality tested

None of the products contain ingredients of animal origin.

Suitable for vegetarians and vegans, contains no lactose and is gluten and yeast free

nnnSPORT®X-Cell contains both pyrimidine and purine bases and is sourced from yeast, although no yeast remains in the finished product.

Certification

All our products are produced & packed in a facility that holds Halal and Kosher certification.

nnnSPORT®X-Cell is registered with the Informed Sport testing scheme.

Pricing

Delivery inclusive

Payment terms are 30 days from date of delivery.

Minimum Order size:

6 units: Price available on application (ex VAT)

Higher volume discount

24 units: Price available on application (ex VAT)

Lead times

Order to dispatch is: up to 14 days

(but usually within 5 days).

Reference material (available on request)

Athletic benefits brochure:

Scientific studies results

Educational brochure:

Putting you in the picture about nucleotides

Summary of Research:

Published paper abstracts

Articles Compendium:

Published professional sports magazine articles

Contact details

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The Innovation Centre Sci-Tech Daresbury WA4 4FS.

www.nnnsport.com

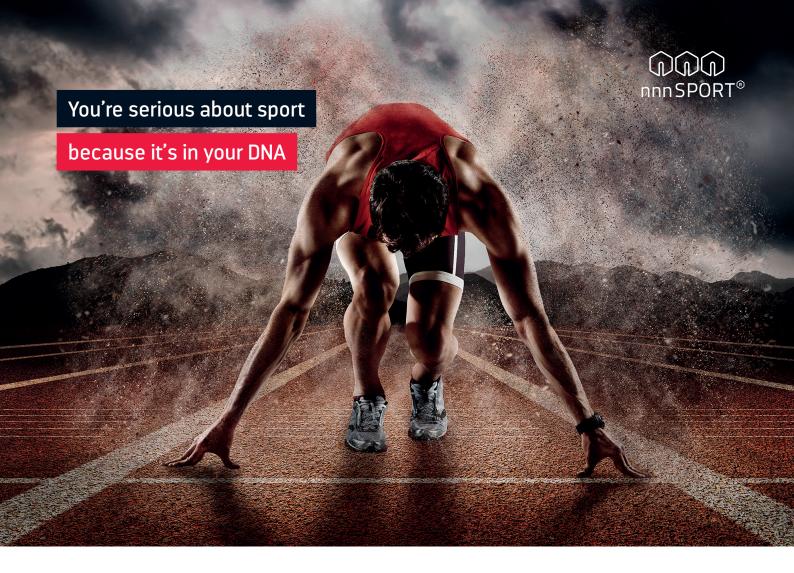
www.nucleotidenutrition.com

Contact: Rachel Hoyle

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e-mail: info@nucleotidenutrition.com





nnnSPORT® X-Cell is a ground-breaking new product that fuels your DNA and supports cellular regeneration by combining approved and established vitamins with a tested and unique proprietary ingredient blend.



Cellular regeneration: the key to elite sporting performance

nnnSPORT® X-Cell contains our proprietary *Nutri*-tide® nucleotide nutritional formula – the only formula on the market that contains precise levels of all five of nucleotides found in the DNA and RNA of human cells.

Nucleotides are the key to cellular regeneration

Designed to address the needs of serious athletes and successfully tested by sportsmen in independent high-intensity and endurance trials*, nnnSPORT® X-Cell is quality tested and registered with the Informed-Sport testing scheme.

In addition to *Nutri*-tide®, nnnSPORT® X-Cell contains carefully selected vitamins and amino acids, including the key vitamin, folate, which contributes to cell division. nnnSPORT® X-Cell is water-soluble and can even be added to shakes, protein drinks or sprinkled onto food. It is ideal for use in combination with your existing training regimen.

To find out more about this ground-breaking product check out our new website www.nnnsport.com and like us on facebook at www.facebook.com/nnnSPORTxcell/ to get notifications and updates.

To request trial results or details of special offers email us on info@nucleotidenutrition.com

*high-intensity and endurance stress trials results are available on request.

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To find out more about this ground-breaking product check out our new website www.nnnsport.com and like us on facebook at www.facebook.com/nnnSPORTxcell/ to get notifications and updates.

To request further trial results or details of special offers e-mail us on info@nucleotidenutrition.com

*high-intensity and endurance stress trials results are available on request.

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Nucleotides sourced and supplied by $\mathsf{ProBIO^{8}AG},$ $\mathsf{Switzerland}.$

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