

Celebrities and Science 2012

Once again we have been charting the rise and fall of celebrity fads, endorsements and claims about science and evidence. We've asked scientists to review a selection of the dubious claims sent to us throughout the year. This is not just an opportunity to talk science to the latest fads – celebrity comments travel far and fast, so it's important that they talk sense about issues like dangerous dieting and medical treatments.

This year, specialists put people right on sports psychology, energy flow and dietary supplements. It's an invitation for famous figures to correct their reported comments. But really we'd rather they didn't get it wrong in the first place. We have over 5,000 specialists and hundreds of research organisations offering help to anyone in the public eye who wants to distinguish sound science and evidence from nonsense. It's just a phone call away.

WHAT'S NEW FOR 2012?

In 2011 **Simon Cowell** was responsible for the intravenous vitamin craze. This year, **Cheryl Cole** and **Rihanna** were reported to be following the trend, while Simon seems to have moved on to pocket-sized oxygen shots to inhale.

Meanwhile reports had **January Jones** taking dried placenta pills and **Patsy Palmer** rubbing coffee granules on her skin.

In this year's review we couldn't avoid the Olympics, inspiring everyone to be 'faster, higher, stronger'. If you, like us, wondered why so many sporting heroes were flaunting brightly coloured tape, read on for the science verdict.

And celebrities have taken us back to fundamental scientific principles in biochemistry, physics, geology and medicine in their comments on monkeys, aeroplanes, homeopathy and peeing in the pool.

But there is progress... For years we've challenged celebrity promotion of detox diets and immune 'boosting' products. This year, these long-time serial offenders have almost disappeared. Better still, in this review we are able to include celebrities – from actress **Jennifer Aniston** to comedian **Al Murray** – talking sense on food fads, vitamin supplements and alternative medicine. **Gwyneth Paltrow** has given up odd diets after suffering from malnutrition and others in the public eye have sought advice from Sense About Science and medical charities. Could it be that perhaps we are turning a corner?

Celebrities, with a bit more vigilance and checking, we can avoid 90% of misleading science claims. Stick this cut-out-and-keep guide to your fridge!

- **IMMUNE BOOSTING:** you can't and you don't need to.
- **DETOX:** your liver does this.
- **SUPERFOOD:** there is no such thing, just foods that are high in some nutrients.
- **OXYGENATING:** your lungs do this.
- **CLEANSING:** you shouldn't be trying to cleanse anything other than your skin or hair.

All it takes is a phone call to check it out.

Call Sense About Science on
020 7490 9590.

Email: enquiries@senseaboutscience.org. Twitter: @Senseaboutsci

Body fixes

One of the strangest supplements offered to the rich and famous was dried placenta pills, reportedly taken by actress **January Jones**¹.

Catherine Collins,
Principal dietician at St. George's Hospital:



Nutritionally there's little to be gained from eating your placenta—raw, cooked or dried. Apart from iron (which can be easily found in other dietary choices or supplements) your placenta will provide toxins and other unsavoury substances it had successfully prevented from reaching your baby in utero.

And the messiest beauty treatment? Soap star **Patsy Palmer**'s alleged favourite, rubbing coffee granules into your skin – claimed to tackle cellulite².

Dr Gary Moss, pharmaceutical scientist:



Caffeine may have an effect, but the coffee granules won't. It depends how you apply caffeine to the skin: there's a perception that coffee might tackle cellulite because caffeine, in an aqueous solution, can penetrate the skin. However, as coffee granules won't allow the caffeine to penetrate the skin barrier, the only unintended effect is perhaps exfoliation. It also depends on how long the caffeine is in contact with the skin: for any chance of seeing an effect from such a small amount of caffeine you would need to be rubbing coffee into your skin all day!

Footballer **Mario Balotelli**, tennis players **Novak Djokovic** and **Serena Williams**, and Team GB sprinter **Dwain Chambers** were among the sporting stars to appear in the newspapers wearing Kinesio coloured sports tape that claims to 'mend injuries'³.

Professor Greg Whyte, sports scientist:



The manufacturers of Kinesio claim placement of the tape on the skin reduces pain and swelling in injured muscles. It's unclear how this can positively affect inflammation deep within the muscle. There is insufficient evidence to support its use over other more traditional treatments such as taping or strapping. That said, this tape could have added placebo effect. In sport, anything that enhances performance, whether real or imagined, has its place. Any additional benefits that enhance performance may be psychological and these could be profound.

Reports had **Simon Cowell** carrying around small, inhalable bottles of oxygen claimed to reduce tiredness, stress and signs of ageing⁴. Olympic long-jumper **Greg Rutherford** used hyperbaric oxygen treatment, ordinarily used to treat decompression illness in divers, to speed his recovery from knee injury... "**I couldn't believe that something so simple as oxygen and pressure could be having this effect. It cuts down the recovery time by about 30 per cent for me.**"⁵

Kay Mitchell, Centre for Altitude Space and Extreme Environment (CASE) Medicine and Xtreme Everest project:



Breathing 100% oxygen under pressure allows oxygen to dissolve into the blood plasma. When this occurs, increased amounts of oxygen can be delivered to injured tissues. While this is thought to improve recovery rates from sports injury, as you seem to have found Greg, more research into this area is needed.

Doctors are also concerned about the damage caused by oxygen levels that are too high. This oxygen toxicity can cause cell damage leading to cell death, particularly in the lungs where oxygen levels are highest, and so breathing pure oxygen can cause collapse of lung air sacs. This could make you more susceptible to lung infections.

Causes and coincidences...

Actress **Alana Stewart** told *Vanity Fair* magazine: "I had started noticing a few grey hairs coming in, but I noticed that when I was taking [human-growth-hormone therapy] - no grey hairs."⁶

Professor Marco Narici, clinical physiologist:



Alana, hair pigmentation is due to the presence of melanins, produced by specialized cells in the bulb of the hair follicle. Greying of human hair with ageing is due to a loss of melanins in the hair shaft. This happens because the number of melanin producing cells progressively decreases, limiting the number of times the body can renew hair follicles.

Some of the many hormones (sex hormones, growth factors, thyroid hormones, stress hormones being the most important) in the body *can* affect hair growth and pigmentation, but there is little evidence that human growth hormone has any major role in this process. Going grey is a natural and gradual process, Alana, and I'm afraid you can't thank human growth hormone for preventing this problem: it will happen to all of us eventually!

In an interview after recovering from a brain tumour, singer **Sheryl Crow** talked about the suggestion of a link between mobiles and cancer: "There are no doctors that will confirm that... (there is a link). But I do have a theory that it's possible that it's related to that. I used to spend hours on the archaic old cell phones."⁷

Dr Mireille Toledano, epidemiologist and UK lead of COSMOS international long-term cohort study of adult mobile phone users:



Well, Sheryl, overall, the evidence to date is clear that short term use of mobile phones is not linked to brain cancers. We tend to see that people who have had cancer are more likely to over-estimate their phone use

than those who have not had cancer. This 'recall bias' is often the reason why we see reported links between mobiles and cancer.

Oscar-winning actress **Goldie Hawn** lent support to a neuro-education programme aiming to increase children's emotional well-being by teaching them about the brain, saying: "Discovering the mechanics of the brain helps children understand where their emotions come from. It effectively puts them in control of the way they respond to the outside world..."⁸

Professor Sergio Della Sala, neuroscientist:



Goldie, I agree that it can be interesting and fun to know a bit more about the functions of the brain. But discovering the mechanics of the brain would not help children to understand their emotions any better than understanding the chemical components

of a ball would help them to kick it better! There are too many unsubstantiated recipes allegedly improving children's learning and well-being, including Brain Gym, NLP or MindUp. But school is a serious matter and so meaning well, gut feelings, common sense, intuition or gurus' opinions are not the way: Show us the evidence.

Mind power and magic

TV personality **Simon Cowell** told his twitter followers: "Today I had someone heal my house. Strange but great. The healer brings in good energy. Someone told me about it. It takes a couple of days."⁹

Professor Richard Wiseman, psychologist:



There really isn't any evidence that anyone can 'heal' your house, Simon. Normally house healers say a few prayers and occasionally explain how re-arranging things will help the energy flow through your property. This might make

you feel less anxious and so feel better, but it's a lot of money to pay for a placebo and a bit of furniture shifting.

Continued ►

Gaby Roslin, TV presenter, said: **“Homeopathy works extremely well on children.”**¹⁰

Dr Keith Hopcroft, GP, editorial adviser to **Pulse** magazine and **Sun** doctor:



If homeopathy works at all – and that’s a capital letters flashing neon ‘If’ – then it’s through the placebo effect. And that’s an effect children are very open to: ask any parent, who’ll tell you that doses of cuddles, attention and ‘magic medicine’ tend to work incredibly well.

Professor David Bellamy, broadcaster and botanist, said: **“I support homeopathy as it’s safe and cheap. Compared to the usual drugs, it can be effective.”**¹⁰

Edzard Ernst, Emeritus Professor of Complementary Medicine:



Homeopathy may be cheap, David, even safe, but as it contains no active molecules, it is certainly not effective. The notion that it is as good or better than usual drugs is not just misleading, it is dangerously wrong and could cost many lives.

Powerful people on the basics

It might seem pedantic but it is rather alarming how often UK Chancellor **George Osborne** has used ‘110%’ over the past year, saying that the Government should **“focus 110% on the economy”** and **“give its 110% attention and effort and energy”** to create economic growth.¹¹

Nigel Hawkes, former Director of Straight Statistics:



You can’t have 110% of anything. It may be a harmless turn of phrase among sportsmen, pop singers or contestants on *The Apprentice*. But it’s still nonsense to anybody with any feeling for numbers. Come on, George, you’re Chancellor of the Exchequer!

Try to convince us you know some maths.

Speaking in the run-up to the recent US election, Congressman **Paul Broun** told one audience: **“There’s a lot of scientific data that actually shows this is really a young Earth. I believe that the Earth is about 9,000 years old.”**¹²

Dr Katherine Royse, geologist:



Paul, there is no scientific data whatsoever that suggest that the earth is 9,000 years old, even back in the 1860s Lord Kelvin and Charles Darwin amongst others estimated that the earth was many millions of years old.

We now know that actually the age of the earth is 4.6 billion years. We get this age from radiometric dating of meteorite material and it’s consistent with the ages of the oldest known bits of rock from the Earth and the Moon. In fact, Paul, you might be interested to know the oldest minerals analysed are zircons found in Western Australia and they are at least 4.4 billion years old.

An emergency landing by a plane on which US Presidential candidate **Mitt Romney’s** wife was travelling may have caused him distress. But speaking about the incident he unwittingly gave rise to a scientific misconception about where the real danger lay, saying: **“When you have a fire in an aircraft, there’s no place to go ... and you can’t find any oxygen from outside the aircraft to get in the aircraft, because the windows don’t open. I don’t know why they don’t do that. It’s a real problem. So it’s very dangerous.”**¹³

Continued ▶

Dr Jakob Whitfield, aeronautical engineer:



Unfortunately, Mitt, opening a window at height wouldn't do much good. At a jet aeroplane's normal flight altitude, the outside air does not contain enough oxygen to allow normal breathing (it's about 40% of the levels on the ground); this is why an airliner's cabin is pressurised. In fact, if you could open a window whilst in flight, the air would rush out of the aircraft cabin because air moves from the high pressure cabin to the lower pressure outside, probably causing further injury and damage.

US politician Rick Santorum, falling into the trap of confusing 'evidence' with 'belief', said: "If he wants to believe he is the descendent of a monkey then he has the right to believe that, but I disagree with him on this liberal belief."¹⁴

Professor Stuart West, evolutionary biologist:



Rick, you seem to be confusing the way in which scientific knowledge is acquired with a particular political belief. Darwin hypothesised that a branching diagram or tree could be drawn showing how all of life had arisen over evolutionary time. In the specific context of humans, Darwin suggested that we were most closely related to the apes, then other primates, then other mammals and so on. Every time this idea has been tested it has been supported – with fossils, morphology or genetic sequences. Quite simply, evolution by natural selection provides our current best understanding of how we are related to the rest of life on Earth.

Sounder stuff on health and lifestyle...

Will next year's celebrities be asking the right questions about the science? Well, promising signs from this year are that famous figures are getting their science straight...

The Saturdays' **Una Healey**, talking about the diet she credits with helping her lose weight post-pregnancy, emphasised the importance of eating carbohydrates: "I did it for six weeks. It did help but I was adding rice to it as it didn't have any carbs. I can't do without carbs."¹⁶

Gaynor Bussell, registered dietitian and British Dietetic Association spokesperson:



Una, it was a sensible move to add the carbohydrates: Cutting out a whole food group would seriously distort your diet! Not only should carbs be the source of about 50% of your energy, but they are also a good source of fibre, vitamins and minerals. Post-pregnancy this is as important as ever – partly because your reserves of vitamins and minerals could be depleted after nine months metabolising for two, and you will still be using up reserves if breast-feeding.

England Cricketer **Stuart Broad**, when asked "Do you take any supplements?", told *The Mail*: "I think you can get enough out of your diet without them. But when we travel to places like India and Bangladesh, we do take them."¹⁸

Sian Porter, consultant dietitian and British Dietetic Association spokesperson:



Good on Stuart for realising that you can 'do it with food' – a healthy balanced diet can provide all the nutrients you need. When touring Stuart may be unsure of the nutrition quality and variety of his food so may take a supplement during this time as an insurance policy.

Continued ►

Actress **Jennifer Aniston** said in an interview: **“I stopped dieting when I figured out that you just have to eat regularly and properly within moderation... The fads are too much,”** Aniston said. **“The fasts – when you hear people saying, ‘I’m going on a cleanse,’ it’s just so bad for your body.”**¹⁷

Ursula Arens, member of the British Dietetic Association:



The body has many systems to support ‘cleansing’, and a healthy diet containing fibre from foods such as fruits and vegetables, is the best way to support gut health. Extreme diets and fasts will make you feel unwell and do not support good health. A fantastically sensible comment Jennifer!

In response to fellow US Olympic swimmer Ryan Lochte’s quip that all professional swimmers pee in the pool, (18-times) gold medallist **Michael Phelps** said: **“Everybody pees in the pool. It’s kind of a normal thing to do for swimmers. When we’re in the water for two hours, we don’t really get out to pee. Chlorine kills it so it’s not bad.”**¹⁵

Stuart Jones, biochemist:



In fact Michael, urine is essentially sterile so there isn’t actually anything to kill in the first place. Urine is largely just salts and water with moderate amounts of protein and DNA breakdown products.

Chlorine just prevents bacteria from growing in the pool. So you’re basically right – peeing in a swimming pool, even if all swimmers do it simultaneously, has very little impact on the composition of the pool water itself. An Olympic size pool contains over 2 million litres of water and a single urination is somewhere in the region of 0.2 litres. To have any significant effect on the overall composition of the pool water you’d need a serious amount of peeing!

Comedian **Al Murray** was asked “Do you pop any pills?” and replied:

“They’re b***s, you get them in your diet, you don’t need to spend money on vitamins and supplements. It’s all voodoo. Except maybe cod liver oil.”**¹⁹

Lucy Jones, spokesperson for the British Dietetic Association:



Al you are right when you say that most of us get all the nutrition we need from a balanced diet. Supplements do play an important role when used correctly for the right people – this includes iron for anaemia, B12 for vegans and folic acid in pregnancy. And even cod liver oil isn’t for everyone, as its high levels of vitamin A can be dangerous in pregnancy. Supplements are like glasses: Not everyone needs them and you need to get the right pair with the right prescription, it’s no good picking up someone else’s!

Gary Kemp, former singer with Spandau Ballet, explained his view on alternative medicine:

“I’ve tried acupuncture, performed by my chiropractor, but I’m a pragmatic cynic and believe hardcore medicine and science should be your first port of call before you deviate to other things, otherwise your life could be at risk.”²⁰

Simon Singh, science writer and co-author of ‘Trick or Treatment? Alternative Medicine on Trial’:



Gary, you’re absolutely right to highlight the value of ‘hardcore’ medicine, which simply means that the treatment has been tested and shown to be effective. And also right to raise the issue of risk. Patients who venture towards alternative medicine may suffer, either directly from the alternative therapy, or indirectly if it means rejecting a mainstream therapy.

Reviews from previous years

2006, in which **Heather McCartney** blamed milk for obesity in children and **Madonna** discussed how to neutralise radiation.

2007, which saw TV presenter **Sarah Beeny** extol the virtues of chemical-free make up and actress **Nicole Kidman** discuss brain-training.

2008, in which US presidential hopefuls, **Barack Obama** and **John McCain** theorised the link between MMR and autism, while **Sarah Palin** questioned the value of funding research.

2009, in which **Roger Moore** blamed foie gras for terminal illnesses and **The Black Eyed Peas** lead singer **Fergie** looked to shots of vinegar to help her stay slim.

2010, where cage fighter **Alex Reid** shared his tips for preparing for a fight (he 'reabsorbs' his sperm).

And 2011, in which **Juliette Lewis** rehydrated herself with coconut water while **Simon Cowell** upped his vitamin intake via a drip.

Sense About Science is a small charity that equips people to make sense of science and evidence.

You can send us examples of celebrities speaking about science and medicine: enquiries@senseaboutscience.org.

We are able to do this because of donations from members of the public. You can help us continue: go to www.senseaboutscience.org/donate.

1. *The Independent*, Celebrities: Mommie weirdest, 29th Mar 2012
2. *Daily Express*, Why coat hangers are the secret to smooth hair, 24th May 2012
3. *The Guardian*, Kinesio tape: the latest must-have treatment for sports injuries, 29th July 2012; *Daily Mail*, The bizarre tape that has adorned Olympic athletes: Researchers say there is 'no evidence' it works, 2nd Aug 2012
4. *Daily Mail*, Oxygen-Factor: Cowell's anti-ageing trick is inhaling cans of fresh air, 17th Feb 2012
5. *Daily Mail*, 'Super Saturday' hero Greg Rutherford won gold thanks to a diving chamber cure... so why can't you get it on the NHS?, 8th Dec 2012
6. *The Daily Telegraph*, Rod Stewart's former wife Alana Stewart finds secret of eternal youth, 2nd Feb 2012
7. *Daily Mail*, Sheryl Crow blames cell phone use for tumour... revealing she thought she had Alzheimer's when her brain went 'mushy', 11th Sep 2012
8. *The Daily Telegraph*, Happiness: can you learn to be happy?, 18th Feb 2012; *Daily Express*, Goldie Hawn's happy hour, 7th Mar 2012
9. *Daily Mail*, Cowell calls in healer to de-stress his £15m Beverly Hills mansion weeks after collapse with exhaustion, 26th Sep 2012
10. *The Daily Mirror*, Homeopathic healing: The stars who swear by alternative medicine, 14th Aug 2012
11. *The Guardian*, George Osborne's 110% – do the maths please, chancellor, 7th Aug 2012; *The Huffington Post*, George Osborne: I Will Focus 110% On Economy In Wake Of Gloomy Outlook, 8th Aug 2012
12. *The Independent*, Republican Congressman says evolution is 'lie from hell', 9th Oct 2012
13. *Los Angeles Times*, Mitt Romney pulls in \$6 million at Beverly Hills fundraiser, 23rd Sep 2012
14. *The Daily Telegraph*, Republicans turn their back on the Enlightenment, 10th Jan 2012
15. *The Daily Telegraph*, 'Michael Phelps admits: we do pee in the pool', 6th August
16. *Daily Mirror*, Rice and easy does it for Una, 15th May 2012
17. *Now*, Jennifer Aniston: I've stopped dieting and following crazy food fads, 23rd Oct 2012
18. *Daily Mail*, 'I sleep very well. No wonder I look so young for my age': Under the microscope with Stuart Broad, 12th Nov 2012
19. *The Sun*, Celebrity health check, 29th Nov 2012
20. *Daily Mail*, 'I've always hated smoking and never smoked myself, nor have I dated someone who smokes': Under the microscope with Gary Kemp, 20th Nov 2012

Check the facts. Call Sense About Science on

 020 7490 9590

Sense About Science is a small charity that equips people to make sense of science and evidence.
Email: enquiries@senseaboutscience.org. Twitter: @Senseaboutsci. 14A Clerkenwell Green, London, EC1R 0DP. Sense About Science is a Registered Charity No. 1146170 - Company No. 6771027