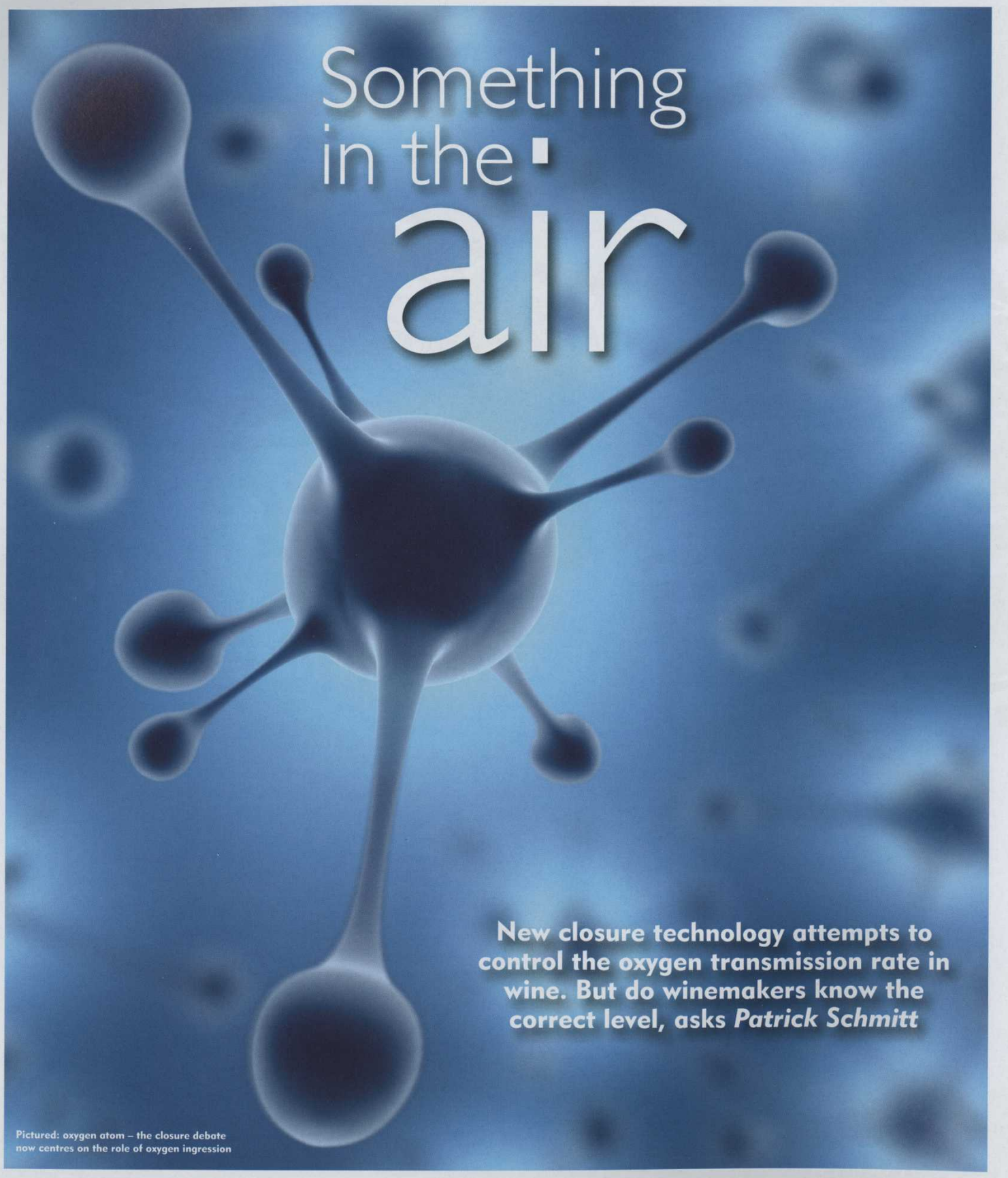
Something in the air



New closure technology attempts to control the oxygen transmission rate in wine. But do winemakers know the correct level, asks *Patrick Schmitt*

Pictured: oxygen atom – the closure debate now centres on the role of oxygen ingression

ONE CAN only guess at the cursing behind closed doors among closure manufacturers when winemakers are mentioned. When they are not rightly questioning reliability, they're asking for longevity. Then they want recyclability, and of course a good price. What about the appearance? Does it offer convenience? And can you conduct some consumer research?

However, we must thank the winemakers – even if the stopper makers don't – for driving the development of closure technology in new and unforeseen directions. And currently the overriding trend is towards answering the need for different oxygen transmission rates (OTRs) – a reliable way of ensuring negligible or gradual ingress of air.

"If you have a million natural corks then you have a million different OTRs," says Dean Banister, Oeneo's international marketing director, somewhat controversially. "The result is one bottle could be very good, the next oxidised and the next reductive," he adds. But as winemakers are fully aware, the solution is not necessarily in the perfect seal. Rather, depending on the wine style and life span, different OTRs may be necessary. "We now have five different OTR options on our Diam closures," continues Banister of the company's agglomerated cork closure.

"One is as low as a screwcap with a SaranTin liner and another has a slightly higher OTR, similar to a screwcap with a Saranex liner," he begins, at the same time highlighting the difference in permeability between the two liners for screwcaps (this closure is no longer considered a hermetic seal).

The least permeable version from Oeneo has been dubbed DIAM 10 because it guarantees "a minimum 10-year ageing potential". Although Banister admits the agglomerated cork closure will last longer, "we can prove that in 10 years it will be mechanically sound", he says.

But can DIAM guarantee against flaws in the bottle neck, often cited as the cause for variable OTRs? In short, yes. The cork-based product has a high natural flexibility ensuring it can push against irregularities in the glass. However, for maximum insurance against oxygen ingress, Banister adds, "You must choose the right size of DIAM relative to the bottle diameter. While plastic corks tend to be 21mm [diameter] in an 18mm neck, allowing for a 3mm compression, for the same bottle we would recommend DIAM with a 24mm diameter. It has a greater elasticity. And, because it is an industrialised product it has greater uniformity [in elasticity] than natural cork."

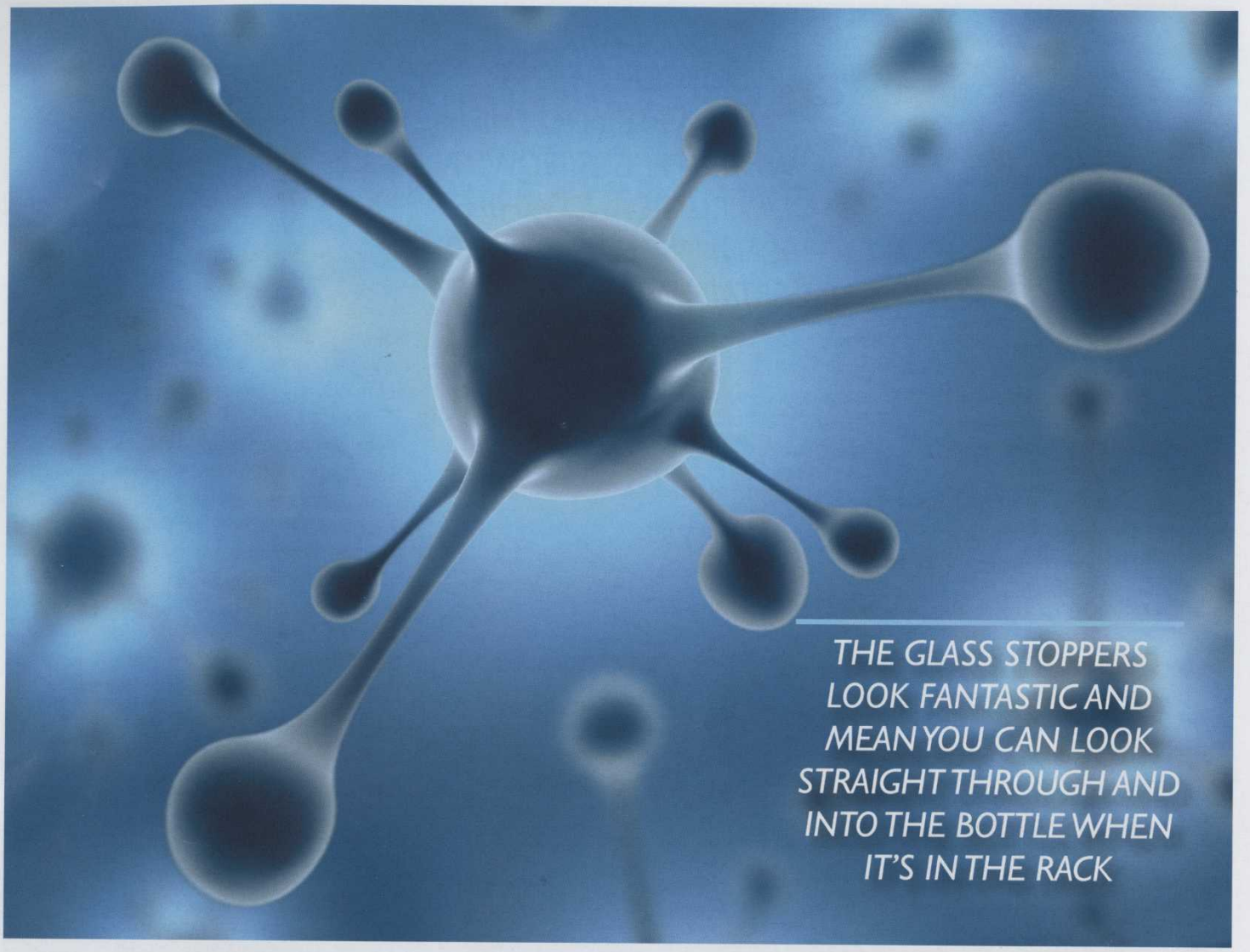
THE AMOUNT OF OXYGEN THAT IS ALLOWED INTO THE WINE AFFECTS HOW IT DEVELOPS AND WHILE SEALING OFF IS OK FOR CERTAIN WINES, IT'S NOT FOR OTHERS

Further research

Such is the topicality of OTRs for the quality and development of wine, Nomacorc with G3 Enterprises and Lallemand founded 02inWines earlier this year to research oxygen management. Olav Aagaard, global director for oxygen management business at Nomacorc, explains. "We can engineer how much oxygen goes into the wine [through the company's synthetic stoppers] but the technology is no use if you don't know how much oxygen to put in the wine. So we've been looking at what is the influence of oxygen on wines when they are in the bottle to help us understand how much oxygen you need to put in there. We could make a range of closures with different OTRs but they would be no use if one is picked at random."

Research with a range of international bodies such as UC Davis and AWRI (the Australian Wine Research Institute) has shown that "the amount of oxygen that is allowed into the wine affects how it develops and while sealing off is OK for certain wines, it's not for others", continues Aagaard, referring to colour, aroma, taste and structure evolution. Currently Nomacorc has synthetic closures on the market with four different OTRs, while the company has also produced a tool to accurately measure the amount of dissolved and headspace oxygen in the bottle. Called PreSens Fibox, Aagaard stresses the need to analyse the wine after bottling because of the range in amount of oxygen that a wine can be exposed to during the bottling process.

Elsewhere, synthetic closure maker Neocork Technologies is soon to launch three new products, most likely in autumn this year. According to Mark Coleman, ▸



director of global business development for the company, "These products, tentatively branded as 'Ultra', 'Classic Advantage' and 'Value', are engineered to allow winemakers to choose the closure which best suits their wines' intended evolution or shelf life. Each will have distinct advantages in regards to OTR performance and cost, while using materials which are significantly cleaner than anything currently available in the market."

Meanwhile, Karine Herrewyn, marketing manager at Alcan Packaging Capsules, makers of Stelvin screwcap, says the company is still at the R&D stage on OTR but will "launch in a few months new lines with more options in terms of permeability". Similarly, Guala Closures Group is looking at varying OTRs on screwcap, working initially towards a hermetic seal.

Finally on the subject of OTR, Penfolds chief winemaker Peter Gago is trialling a glass-to-glass closure on a few cases of 2006 Grange. His unique design is different from existing glass closures which have a silicon ring between the bottle top and bottle. His next trial will be using a sintered glass disc in the stopper. This is a type of porous glass which would allow for the ingress of oxygen at varying rates, depending on requirements. Aside from his quest for the perfect closure, Gago identifies a further benefit. "The glass stoppers look fantastic and mean you can look straight through and into the bottle when it's in the rack."

Sparkling solutions

Beyond the developments on OTR, stopper technology also appears to centre on new solutions for sparkling wine. Closures supplying this sector have the specific demands of keeping gas under pressure in, and then being able to release it suddenly, ensuring consumers get the popping sound that is essential to the appeal of this wine. Unveiled at this year's London Wine Fair was a novel solution from Alcan. Called Maestro, it is based on a crown cap and incorporates a lever for removing the aluminium closure. While Australian sparkling wine Green Point has been ▸

sealing its entire range of wines under crown cap since 2007, this Alcan closure is slightly different and marks the first time an aluminium stopper has been used on a finished Champagne – Duval-Leroy's Clos des Bouveries Vintage 2004 has opted to use Maestro. As Alcan's Herrewyn says, "It's a simple idea and being based on the crown cap it is a closure well known by Champagne producers [virtually all Champagne is aged under crown cap]. It's also very easy to open and the popping sound is retained. We think it's a major innovation in wine closures in general."

Somewhat overshadowed by Alcan's new product, but still groundbreaking, is Guala's screwcap for "slightly sparkling wine". The closure, called Moss, has a liner developed to maintain carbonation levels of up to two bars pressure. Brazil's Salton Winery has adopted the closure for a new lightly sparkling range named Lunae, which will be exported worldwide. Sadly a screwcap can't promise the all-important pop on release.

ACQUAMARK USES A LOWER VISUAL GRADE OF CORK WITH HIGHER POROSITY. BUT WHEN THESE PORES ARE FILLED WITH A WATER-BASED SOLUTION IT GIVES A HIGH QUALITY PERFORMANCE AND THE VISUAL IMPACT OF NATURAL CORK

Interestingly, outside the synthetic closures arena, Oeneo's Banister records that DIAM's sparkling variant – Mytik Diamant – has been the fastest growing of the group's products over the last 18 months. "We now supply 150 Champagne houses," he says, adding, "the biggest issue for the houses wasn't TCA but flat wine. DIAM Sparkling's carbon dioxide retention – because of the density and elasticity of the product – has driven the demand."

Portuguese cork giant Amorim has also enjoyed success in the sparkling category and last year introduced a new cork closure called Spark One. It is made from cork micro-particles and is designed for early consumption sparkling wines, while guaranteeing strong pressure resistance.

A real corker

Finally, what of natural cork? Here too the innovation continues. In particular, Amorim has unveiled a new solution, designed, in the words of Carlos de Jesus, director of communication, "to allow a natural cork stopper into sectors that were previously out of bounds". Called Acquamark, the latest Amorim product is a natural cork with a water-based coating filling any voids in the stopper. This allows Amorim to hit a

CLOSURES

PACKAGING

Beyond the specifics of closure types and trends it is interesting to pen a quick note on overall wine packaging developments, in particular the move towards lighter bottles. Currently the average empty 75cl wine bottle weight imported into the UK is 500g, according to WRAP (Waste Resources Action Programme). However, Quinn Glass director Peter Fitzgerald notes the development of bottles weighing as little as 300g, and these lightweight bottles are now being used for Tesco's own-label wine range.

Beyond glass, other lighter packaging solutions include liquid cartons, aluminium (wine in cans are growing in popularity, according to Rexam), PET, bag-in-box or pouches. For example, at 54g, a PET bottle weighs around 440g less than the average glass wine bottle. Further, the development of multi-layer PET bottles such as those from Paul Sapin – consisting of two layers of PET with a layer of nylon in between – provide a complete mechanical barrier to oxygen. This allows them to be used for wines with a longer shelf life.

But to go back to glass, Quinn's Fitzgerald points out that bottles may soon become even lighter, reducing their carbon footprint yet further. "The next tranche of lightweighting will involve nano technology." This uses nano beads which make the glass stronger allowing bottle weights to fall further. "Also," he continues, "a side benefit of nano technology may be the ability to replace the widget in cans and bottles because you can design the nano beads to form nucleation points. You could flush the bottle with nitrogen which would adhere to the nano beads and on release would create a froth."

low price point, offer the environmental and visual benefits of natural cork, and ensure a consistent performance. Why is the product cheaper? "Acquamark uses a lower visual grade of cork with higher porosity. But when these pores are filled with a water-based solution it gives a high quality performance and the visual impact of natural cork."

In essence, this product "means we can produce a cost-effective natural cork closure for sectors where price competition is at its fiercest," adds de Jesus who hopes to "capture a significant proportion" of this market, which amounts to around 1 billion units. 100 wineries have apparently already signed up for the product.

The next stage for Amorim is further work on entirely natural glues in its agglomerated products. "We just need to make sure the glues pass all tests," de Jesus says, pointing out that the use of natural solvents will increase Amorim's environmental credentials yet further. But this – the carbon footprint and sustainability – of closures is another issue altogether, if no less important and possibly more emotive. **db**