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## Leading blood pressure medication Diovan<sup>®</sup> with diuretic reduces key sign of artery ageing which is linked to risk of heart attack and stroke

- *First study to show Diovan/HCT improves artery elasticity in patients with type 2 diabetes, high blood pressure and kidney disease<sup>1</sup>*
- *Diovan/HCT demonstrated superior benefits on artery elasticity, a strong predictor of increased risk of stroke and heart attack<sup>2</sup>, compared to amlodipine*
- *Diovan/HCT lowered albumin excretion rate, a key marker of kidney disease, by 35% compared to a rise of 24% with amlodipine<sup>1</sup>*
- *Diovan is the world's number one branded high blood pressure medicine<sup>3</sup>*

**Basel, June 5, 2008** — A study published in the latest issue of *Hypertension* demonstrates that the leading angiotensin receptor blocker (ARB) Diovan<sup>®</sup> (valsartan) in combination with the diuretic hydrochlorothiazide (HCT) improves artery elasticity (i.e. reduces stiffness), a sign of artery ageing in patients with type 2 diabetes, high blood pressure and kidney disease compared to those taking another widely-used high blood pressure medicine, amlodipine<sup>1</sup>.

Diovan/HCT demonstrated significantly superior benefits on artery elasticity compared to amlodipine, even though both treatment regimens had a similar effect in reducing blood pressure<sup>1</sup>. This is the first report of an improvement in artery elasticity with an ARB in this patient population.

The ageing process is associated with a gradual loss of elasticity in the arteries, but this is prematurely accelerated in people with diabetes and/or high blood pressure<sup>4</sup>. Patients with less elastic arteries are at increased risk of stroke and heart attack<sup>2</sup>.

The study demonstrated that Diovan/HCT, the number one branded high blood pressure medication<sup>3</sup>, improved the elasticity of arteries in people with high blood pressure, type 2 diabetes and kidney disease<sup>1</sup>.

“Diabetes creates a potentially dangerous loss of elasticity in the arteries in addition to the natural ageing process,” said Dr. Janaka Karalliedde of King's College London, the principal investigator of the study. “People with diabetes have an arterial age around 10 years older than those without<sup>5</sup>, putting them at increased risk of death from heart disease or stroke. That is why the benefit of Diovan/HCT on artery elasticity in these patients is particularly important.”

The measure of artery elasticity used in this study (aortic pulse wave velocity, abbreviated here as PWV) is a strong predictor of increased risk of stroke and heart attack in people with high blood pressure, type 2 diabetes and kidney disease<sup>1,2</sup>. PWV measures how quickly a blood pressure pulse travels along an artery – the stiffer the artery, the higher the PWV –

and is an independent marker of cardiovascular risk and mortality in people with high blood pressure<sup>6</sup>.

The 24-week study compared the effect of a Diovan-based treatment (Diovan with the addition of HCT after four weeks) with that of amlodipine (up-titrated after four weeks) on PWV in 131 people with type 2 diabetes, high blood pressure and a marker of kidney disease called microalbuminuria<sup>1</sup>.

Both Diovan/HCT and amlodipine demonstrated similar reductions in systolic blood pressure, but Diovan/HCT demonstrated a significantly greater reduction in average PWV compared to amlodipine (-1.1 meters per second,  $p=0.001$ )<sup>1</sup>. Systolic blood pressure, measured when the heart contracts and pumps, is the most important indicator of a person's risk of cardiovascular events<sup>7</sup>.

“These results demonstrate that Diovan/HCT improves artery elasticity to a greater extent than the widely used high blood pressure medicine amlodipine in these high-risk patients, adding to the spectrum of protective benefits provided by Diovan-based therapies,” said Trevor Mundel, MD, Head of Global Development Functions at Novartis Pharma AG. “We continue to show the efficacy of Diovan over and above blood pressure lowering alone, offering patients a real benefit for improved artery health.”

The study also compared Diovan/HCT with amlodipine on albumin excretion rate (AER), a key marker of kidney disease. In the Diovan/HCT group the AER fell by 35% compared to a rise of 24% in the amlodipine group ( $p=0.0004$ )<sup>1</sup>, building on previous results demonstrating Diovan's potential kidney-protective effects. These include the MARVAL study in which Diovan lowered AER more effectively than amlodipine in patients with type 2 diabetes and microalbuminuria<sup>8</sup>, and the DROP study demonstrating that Diovan reduced urinary albumin excretion in people with type 2 diabetes and high blood pressure<sup>9</sup>.

The benefits of Diovan have been demonstrated through its clinical trials program involving more than 100,000 patients. The large outcome trials VALUE, VALIANT, and Val-HEFT demonstrated effective blood pressure lowering and cardioprotective benefits of Diovan in a range of different patient types<sup>10,11,12</sup>.

Diovan is available as a powerful treatment for high blood pressure in more than 100 countries, for the treatment of people with heart failure in more than 90 countries, and for the treatment of heart attack survivors in more than 70 countries.

Novartis is focused on improving the lives of the hundreds of millions of people with cardiovascular and metabolic diseases. As a global leader in cardiovascular and metabolic health for nearly 50 years, Novartis provides innovative therapies and support programs to treat high blood pressure and diabetes – both major public health issues.

The core of the Novartis portfolio is its cardiovascular medications for the treatment of high blood pressure and diabetes. These include the world's most-prescribed angiotensin receptor blocker, the first and only approved direct renin inhibitor, a single pill combining two leading high blood pressure medicines, and a novel DPP-4 inhibitor. Novartis is dedicated to helping physicians and patients improve cardiovascular and metabolic health through effective medicines, programs and an ongoing commitment to research.

#### **Disclaimer**

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or implied discussions regarding potential new indications or labelling for Diovan or regarding potential future revenues from Diovan. Such forward-looking statements reflect the current views of the Company regarding future events, and involve known and unknown risks, uncertainties and other factors that may cause actual results with Diovan to be materially different from any future results, performance or achievements expressed or implied by such statements. There can be no guarantee that Diovan will be submitted or approved for any additional indications or labelling in any market. Nor can there be any guarantee that Diovan will achieve any particular levels of revenue in the future. In particular, management's expectations regarding Diovan could be affected by, among other things, unexpected clinical trial results, including unexpected new clinical data and unexpected additional analysis of existing clinical data; unexpected regulatory actions or delays or government regulation generally; the company's ability to obtain or maintain patent or other proprietary intellectual property protection; competition in general; government, industry and general public pricing pressures, and other risks and factors referred to in Novartis AG's current Form 20-F on file with the US Securities and Exchange Commission. Should one or more of these risks or uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those anticipated, believed, estimated or expected. Novartis is providing the information in this press release as of this date and does not undertake any obligation to update any forward-looking statements contained in this press release as a result of new information, future events or otherwise.

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Novartis AG provides healthcare solutions that address the evolving needs of patients and societies. Focused solely on growth areas in healthcare, Novartis offers a diversified portfolio to best meet these needs: innovative medicines, cost-saving generic pharmaceuticals, preventive vaccines and diagnostic tools, and consumer health products. Novartis is the only company with leading positions in these areas. In 2007, the Group's continuing operations (excluding divestments in 2007) achieved net sales of USD 38.1 billion and net income of USD 6.5 billion. Approximately USD 6.4 billion was invested in R&D activities throughout the Group. Headquartered in Basel, Switzerland, Novartis Group companies employ approximately 98,000 full-time associates and operate in over 140 countries around the world. For more information, please visit <http://www.novartis.com>

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