



# We show you the money

*2006 compensation survey reveals  
salary, benefits trends*

BY DAVID FORMAN

**S**o you want to work in nano? Had you said that 10 years ago, you would have been laughed out of the room – or, at least, been greeted by empty stares: Work in *what*?

But now nano is hot. The technologies are touted as next-generation solutions for energy, health and environmental woes. Government and business leaders from North Dakota to New Delhi promote micro and nano-related development as a way to boost their economies. Investors are increasingly eyeing – and participating in – the space.

As a result, a micro-nano sector that hardly existed a decade ago now offers employment worldwide. Granted, some of it may be relabeled from semiconductor, biotech and other sectors. But much of it is likewise new. What are the trends? In the following pages, you'll find our first-ever compensation analysis, drawn from an online survey conducted from Dec. 15, 2005 to Jan. 12, 2006.

*David Forman, responsible for our quarterly analysis of trends in venture capital investing, compiled and analyzed the survey results.*

## 2006 compensation survey

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**During** a recent 12-month period, NanoOpto Corp. hired three key employees, so its chief executive, Barry Weinbaum, ought to know a thing or two about the market for senior executives.

He and other experts say a variety of disparate forces are at work in the micro and nanotechnology job market, depending on the level of the job, the type of position and the domain expertise that the employer desires.

“In searching for a CFO we found the most plentiful candidates,” Weinbaum said. The very definition of success at the job, maintains Weinbaum, guarantees that there will be more people in transition. Chief financial officers who take a company public may decide to return to their entrepreneurial roots rather than grapple with the Sarbanes-Oxley Act. And it is common for CFOs of companies that are acquired to move on to newer pastures.

But on the product development side, the problem was not so much too many qualified candidates to choose

He says eventually finding the right person – in NanoOpto’s case, a vice president of product development with experience developing optical products for the consumer market – has been critical to NanoOpto’s success selling new components for use in cellular phones.

Weinbaum’s experience is hardly unique. In fact, the upper echelon of the overall



Photo courtesy of Allan Hoffman

**“It’s a good time for great people,”**

says Allan Hoffman, tech jobs expert for Monster.com. He says top companies are willing to pay a premium for the best employees.

technology sector is currently in the midst of a focus on quality, according to Allan Hoffman, a tech jobs expert for the online job site Monster.com.

“I think we’re seeing that companies are really going for top-notch people and are will-

The combination of those two trends means the “right person” for a particular job can “pretty much write their own ticket,” Hoffman said. As for the rest, job hunting remains a very competitive arena. Micro and nanotechnology appear to be just as prone to these dynamics as any other area of tech.

“The little startups want someone who brings all the intellectual knowledge, understanding of the sector and can pull in an experienced group,” said Pamela Bailey, president of tinytechjobs.com, an online job site that specializes in recruiting for nanotechnology, MEMS and microsystems.

In the case of technical leadership

positions, she said, “They are looking for senior people, almost all with Ph.D.s.”

At the same time Bailey says she is seeing more mid-level jobs crop up as the area expands – in fuel cells, electrical engineering, semiconductor design and materials science.

She also says that there is global competition. Half of the people applying for jobs on tinytechjobs.com are foreign nationals. The results of Small Times’ 2006 compensation survey concurred: About 28 percent of the respondents on our final list were from countries other than the United States.



In many ways, micro and nanotech are no different than the at-large tech industry, our analysis shows, but we also found a few unique traits. Whether you’re looking to find “just the right person” – or to *be* that person – the following pages should help you on your way.

Despite a dramatic increase in business, says Pamela Bailey, president of online job site tinytechjobs.com,

**“I don’t think the nanotech job market has really happened yet.”**

from as it was too few with specific market experience.

“It would have been very easy to hire someone from telecom,” said Weinbaum, “but I was dead set on avoiding that background.”

Telecom, in fact, is the industry from which most existing NanoOpto management had come. But Weinbaum was looking for someone with domain expertise that the company did not already possess.

ing to pay a premium for them,” he said. Hoffman calls it the “Google effect,” referring to that company’s reputation for hiring only the best and the brightest with the most relevant experience.

At the same time, experts say employees are not as willing to change jobs as they were during the tech heyday from the mid-1990s through 2002.

Photo courtesy of Pamela Bailey

## Analysis overview

More than 1,300 readers responded to the survey representing 37 countries worldwide, with the majority coming from the United States. Employees in 45 states plus the District of Columbia participated.

The survey asked 29 questions about employee pay and benefits, employees' educational background and employment history, and the size, type and location of their employers.

The results showed that, as a whole, micro and nanotechnology employees are well compensated and highly educated. On a global basis, the average salary for an employee in micro and nanotechnology is \$84,605 per year. In the United States, the average salary is \$97,978.

Moreover, 36.7 percent of global respondents reported having earned a degree at the level of Ph.D., M.D., or J.D., while 29.1 percent reported having earned

a master's level degree. In the U.S., those figures were practically the same – 37.1 percent and 29.1 percent, respectively.

The high average salaries also reflected a large participation in the survey by high-ranking executives and engineers. On a global basis, 24.5 percent of the respondents in the survey were C-level or VP-level executives, 21.7 percent were manager level and 35.8 percent classified themselves as engineers, researchers or scientists.

By contrast, only 2.7 percent of the respondents were technicians, 1.9 percent business or sales staff and 6.3 percent college or university professors. Due to the fact that the initial survey includes significantly more data on executives as well as engineers, researchers, and scientists, the resulting analysis offers more detailed information on trends in those categories.

As for earning power, those who earned the most in the micro and nanotechnology

field were partners in legal services firms in the United States, followed by C-level executives in the U.S. and Canada. Those earning the least were researchers in Asia, the Middle East and Eastern Europe.

The final list of responses numbered 969, after weeding out data that lacked any salary, hourly pay or benefits information or that included erroneous information.

Of that total, about 73 percent were from the United States. For that reason, the survey analysis includes more extensive information on the U.S. Wherever possible it also includes global data on micro and nanotech employment in cases when the response rate provided enough information to draw meaningful conclusions.

Most of the analysis is also focused on salaried workers. They provided 817 of the responses, or 84 percent of the global final list. In the U.S., salaried workers were responsible for 590 responses, or 83 percent of the total in the U.S.

Global average salary & bonus by job title	U.S. dollars		
	Average salary	Average bonus	Total
Partner	251,600	17,700	269,300
CTO/CSO	148,214	13,021	161,235
President/CEO/Managing director	127,729	28,007	155,736
Vice president of engineering/research/technology	123,276	18,340	141,616
Vice president of marketing/sales/operations/business development	110,840	23,583	134,423
COO/CFO/Chief marketing officer	111,264	8,144	119,408
Manager or director of engineering/research/technology	96,124	5,628	101,752
Manager or director of marketing/sales/operations/business development	83,033	6,852	89,885
College or university professor/director - tenured	77,613	2,750	80,363
College or university professor/director - untenured	70,318	—	70,318
Business or sales staff	60,131	9,934	70,065
Engineer/researcher/scientist	65,631	2,232	67,863
Other	62,904	2,741	65,645
Technician	40,507	5,979	46,486

## Executive compensation – global and U.S.

An analysis of executive compensation in micro and nanotechnology showed some interesting trends, most notably that employees characterizing themselves as presidents, chief executives or managing directors did not on average make dramatically more than their counterparts in other C-level positions, such as chief financial or chief technology officers.

On a global basis, the average salary of a lead executive – that is, a president, CEO or managing director – was \$127,729, compared to \$111,264 for a chief operating, chief financial or chief marketing officer.

However, the compensation of the lead executive was more contingent on performance. The average annual bonus of a lead executive was \$28,007 (about 21.9 percent of the average annual salary), compared to \$8,144 (about 7.3 percent) for the COO, CFO or CMO categories.

However, on a global basis, technical domain expertise is highly valued. In fact,

chief technology officers and chief science officers earned on average more than lead executives: \$148,214, with an average annual bonus of \$13,021, which is roughly 8.9 percent.

The esteem for technical expertise as well as a trend to reward marketing and sales executives with performance-based pay are reflected in the difference between average salary and bonus for different

annual salary while the VPs on the science and technology side netted on average an annual bonus of 14.9 percent.

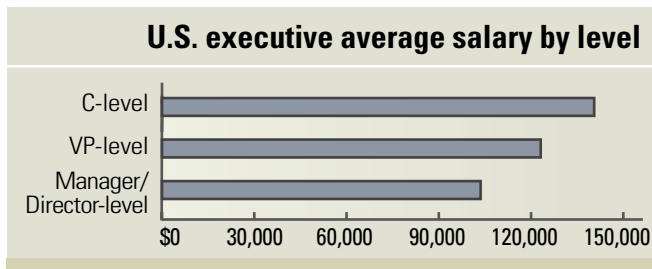
These global trends were reflected in the U.S.-specific analysis as well. However, the average lead executive salary was pulled down somewhat by the plethora of small startups in the micro-nano space. Of the 98 presidents, CEOs and managing directors in the United States who partici-

parted in the survey, 68 of them worked in companies with 10 or fewer employees. Of those lead execs, 63 were founders of their companies.

The pay range for founding lead executives of companies with 10 or fewer employees varies dramatically, from \$250,000 at the high end to \$7,000 at the

low end, suggesting that at least for some founders, the position is not their prime source of income.

In order to gauge the earning power of a lead exec who is not necessarily in an entrepreneurial environment, an analysis was done that excluded companies with 10 or fewer employees. In that case, the average salary for a lead executive was \$160,852.



types of vice presidents working in micro and nanotechnology.

Vice presidents of marketing, sales, operations and business development earned on average \$110,840; their counterparts in engineering, research and technology earned \$123,276. However, the VPs on the business side netted on average an annual bonus of 21.3 percent of their

## Engineer/researcher compensation – global and U.S.

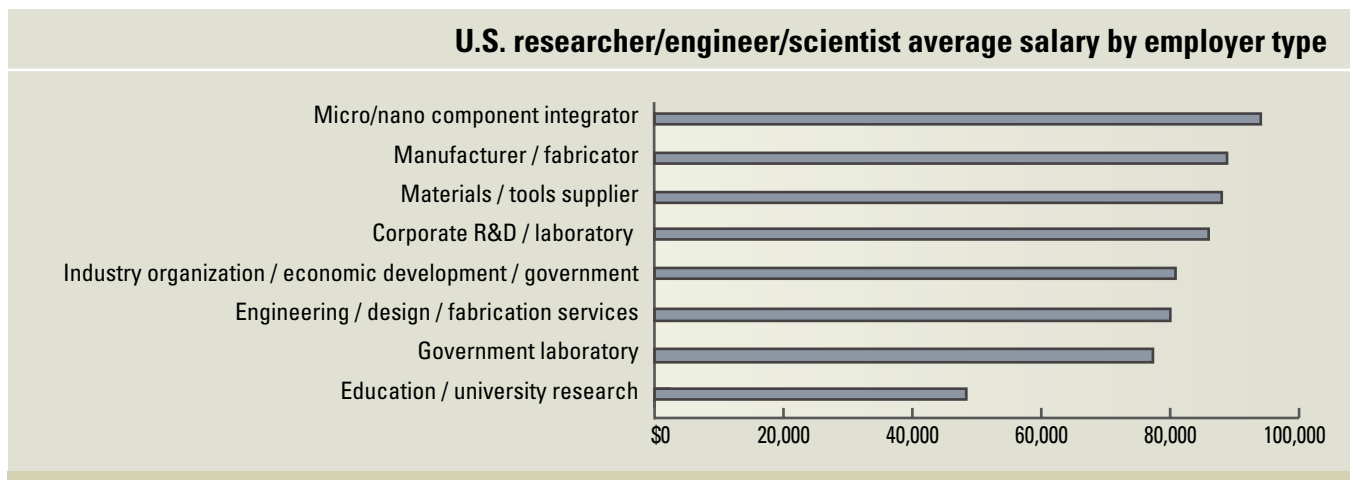
The category of engineer, researcher and scientist received more responses than

any other single job title classification in the survey, totaling 347 responses, or 35.8 percent of the workforce. Of the 347 responses, 310 included salary information, while the remaining either did not include salary data or were hourly workers.

On a global basis, engineers, research-

ers and scientists in micro and nanotechnology earned on average \$65,631 a year. The average annual bonus was \$2,232, which is about 3.4 percent.

Compensation in the category in the U.S. was somewhat stronger, where the average salary was \$79,397 and the aver-



age annual bonus was \$6,391, or roughly 8 percent.

Within the U.S., engineers, researchers and scientists earned the most working for companies classified as micro/nano component integrators, where the average salary was \$94,056 and the average bonus \$6,063. Six other categories were closely bunched, ranging from manufacturer/fabricators, where the average salary was \$88,822, to government laboratories, where the average salary was \$77,325.

The materials/tool supplier and corporate R&D/laboratory categories stand out for their bonuses. Employees in the former earned on average a bonus of 13.6 percent and in the latter 10.4 percent, well above the other categories, most of which hovered around 7 percent.

Government labs had the stingiest bonuses, averaging just 2.8 percent of average annual salary. However, their average pay (\$77,325) was considerably better than that of universities, where engineers, researchers and scientists, earned on average just \$48,369.

However, 59 percent of those in universities had been in their positions for three or fewer years, suggesting a large participation of post-doctoral researchers who traditionally earn lower salaries. Without those employees, the average salary jumped to \$56,381.

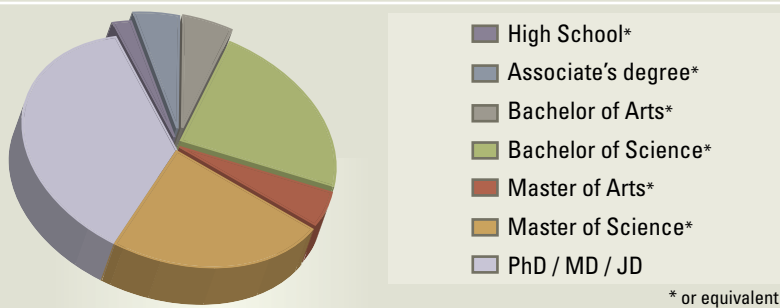
## Education – global and U.S.

On both a global and U.S. basis, higher education correlates directly to earning power in micro and nanotechnology.

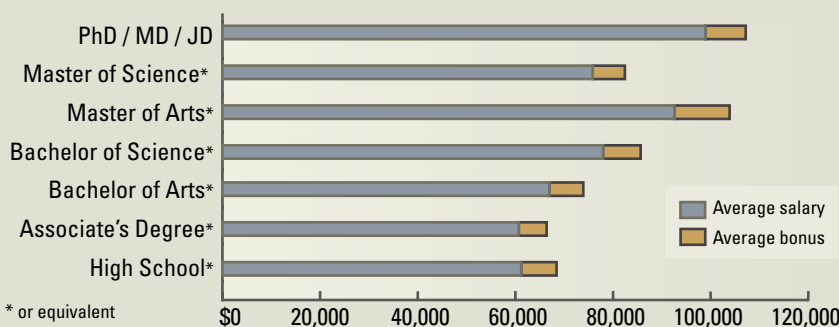
On a global basis, the 36.7 percent of survey respondents who had earned a Ph.D., M.D., or J.D. also earned the most money. The average salary for the category was \$98,919, with an average annual bonus of 8.3 percent. The U.S. figure is slightly higher, with an average salary for a Ph.D.-level employee of \$108,452 and a bonus of \$9,565, which is approximately 8.8 percent.

Master's-level education presented a surprising trend. Workers who had

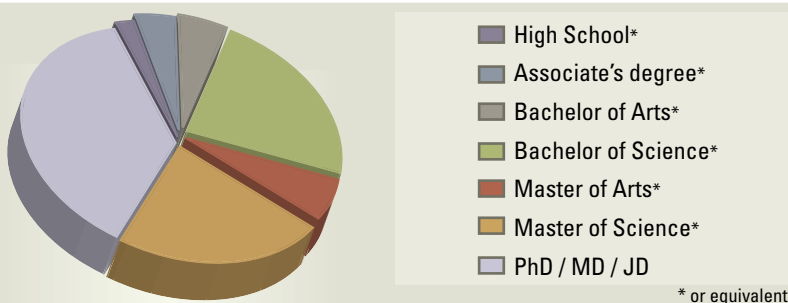
Global percent of workforce by education



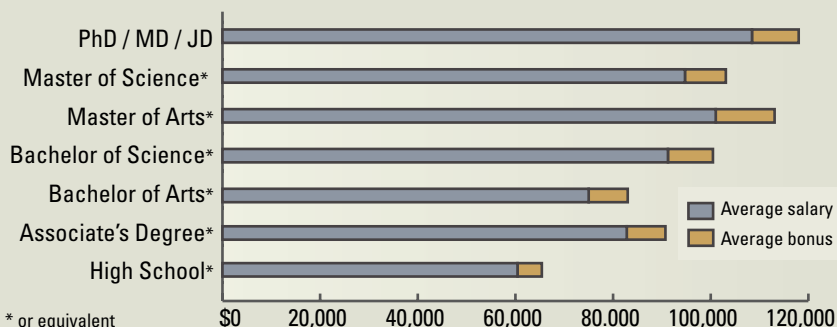
Global average salary & bonus by education



U.S. percent of workforce by education



U.S. average salary & bonus by education



attained a master of arts as their highest degree earned on average more than their counterparts who had attained a master of science, \$92,578 compared to \$75,818. They earned on average even higher bonuses, \$11,292 versus \$6,597.

However, more employees who have scientific education at the master's level participated in the survey. The broader participation of workers with an M.S. includes employment across a wider range of rank and experience, from high-level managers down to entry-level workers.

On the other hand, the M.A. category included a higher percentage of manager and executive level employees but few low-level and entry-level jobs.

The trend played out similarly in the U.S., where M.A. holders earned on average \$101,026 as opposed to M.S. holders, who earned \$94,726.

As far as undergraduate degrees are concerned, however, studying science clearly pays off in micro and nanotech. On a global basis, those whose highest degree is a bachelor of science earned an average

annual salary of \$77,949, as opposed to \$66,937 for holders of bachelor of arts degrees. In the U.S., holders of bachelor of science degrees earned on average \$91,237, while holders of bachelor of arts degrees earned \$75,004.

Likewise, the technical focus of an associate's degree translates into dollars, according to the survey results. This is especially true in the U.S., where holders of associate's degrees earned an average of \$82,800, more than those who had earned bachelor's of arts.

## Regional – U.S.

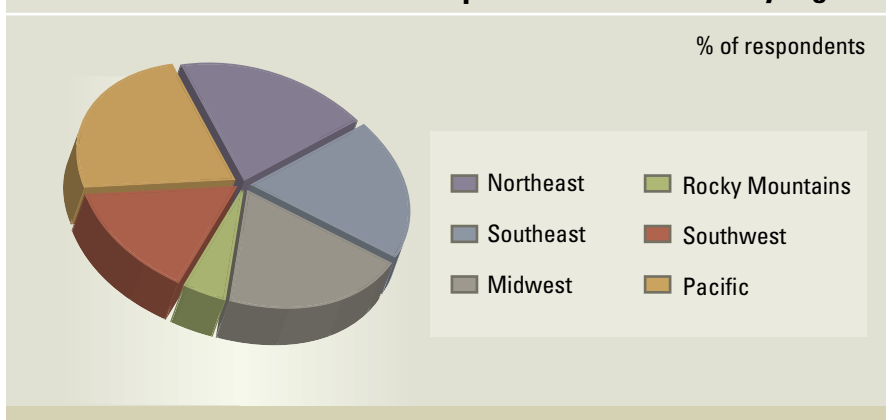
On a regional basis, the average salaries were higher on the coasts and were lower inland. The response rate also showed a higher density of micro and nanotechnology employment along the coasts, as well as in the Midwest region.

The Northeast and Southeast regions were each responsible for 19 percent of the responses of U.S. salaried employees, while the Pacific region was responsible for 23 percent. Salaries in the Northeast and Pacific regions were the highest overall. The average salary for an employee in the Northeast region was \$110,265 and in the Pacific region \$106,634.

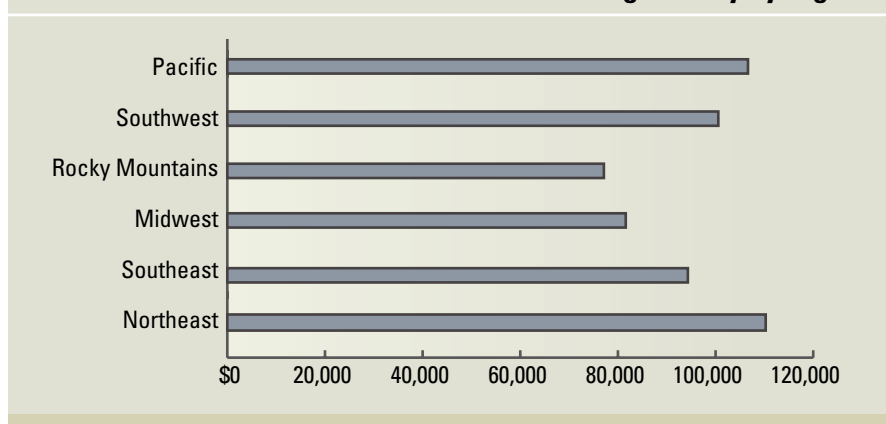
Pay in the Southeast was somewhat lower, with the average salary dipping down to \$94,320. The Southwest region, which accounted for only 14 percent of the responses, had a higher average salary of \$100,559.

Although the Midwest accounted for 20 percent of reported micro-nano employment in the country, the average salary in the region was only \$81,603, just slightly above the Rocky Mountain region, which accounted for 4 percent of the responses and had an average annual salary of \$77,121.

**U.S. percent of workforce by region**



**U.S. average salary by region**



## Age – U.S.

An analysis of age shows that micro and nanotechnology employees are at their peak earning power from their late 50s to late 60s and that earning power

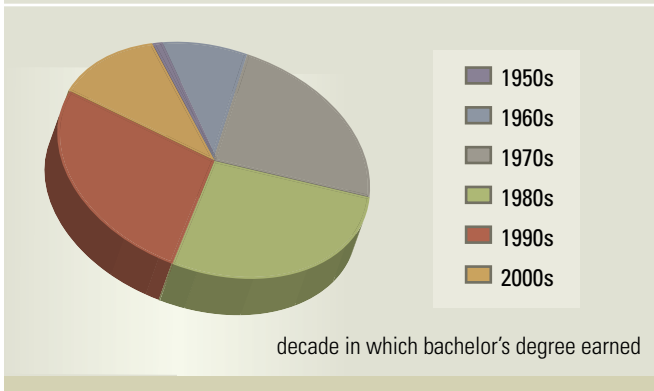
declines significantly after that. There are also relatively few employees in nanotechnology in that age bracket compared to those in their 40s and early 50s.

Employees who earned their bachelor's degrees in the 1960s posted the

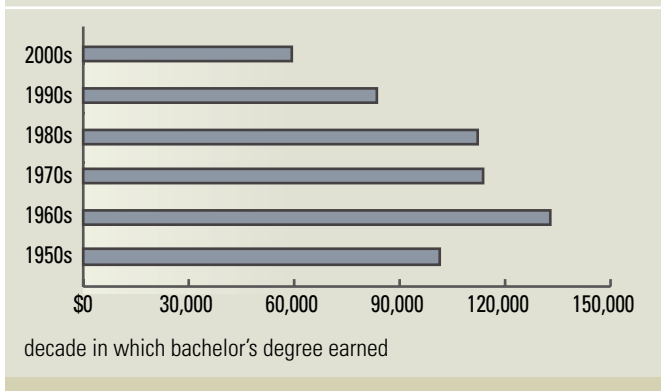
highest average annual salary, \$132,852. Assuming a graduation age of 22, those employees were approximately between 59 and 68 years of age.

Slightly younger workers earned less but there was little difference between

**U.S. percent of workforce by age**



**U.S. average salary by age**



the earning power of those who graduated in the 1980s and in the 1970s. Those who graduated in the 1970s earned, on average \$113,738 and those

who graduated in the 1980s earned \$112,199.

However, the earning power of significantly younger employees is considerably

lower. Graduates from the 1990s earned on average \$83,517 in micro and nanotechnology. Graduates of the new millennium earned an average of \$59,320.

**Benefits – U.S.**

Employers in micro and nanotechnology, by and large, offer a wide array of benefits. However, they also are in keeping with national trends toward replacing defined benefit retirement packages with tax-advantaged retirement programs that are mostly funded by the employee.

A full 88 percent of salaried employees in micro and nanotechnology in the U.S. said their employer offers health insurance. In addition, 75 percent offer dental insurance.

As far as the particular types of health programs that are provided, 55 percent of salaried workers said their employers offer HMOs, 63 percent offer PPOs and 42 percent make health care spending accounts available. (The percentages add up to more than 100 percent because many employers give employees a variety of options from which to choose.)

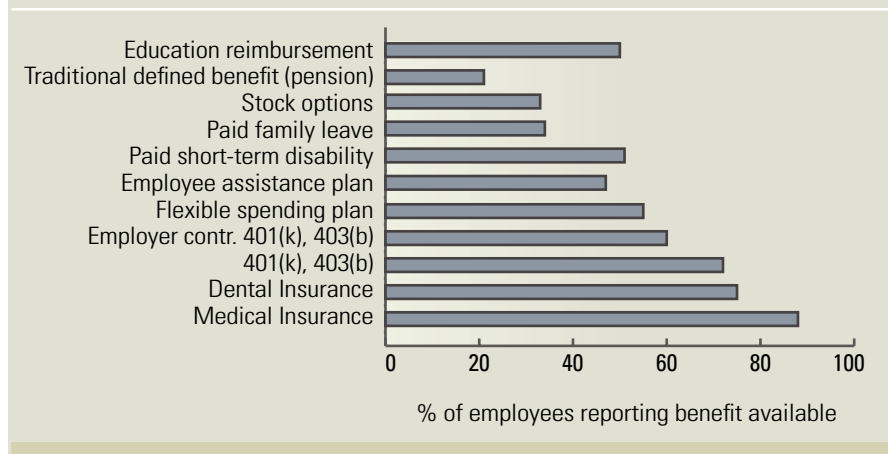
Of the 560 U.S. employees who reported what type of coverage they buy, 302, or about 54 percent, purchased family coverage while about 15 percent purchased coverage for themselves and one other family member and roughly 31 percent reported purchasing coverage only for themselves.

For retirement savings, 72 percent of

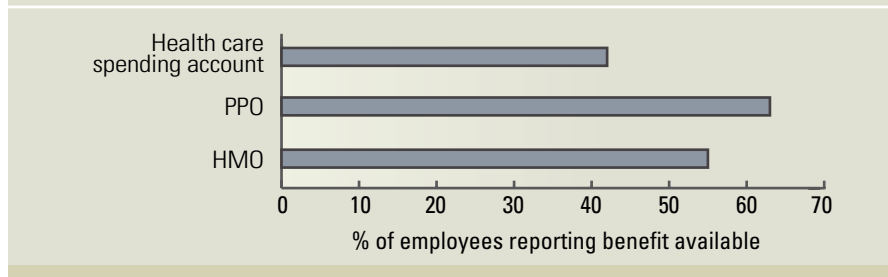
salaried employees said their companies offer a 401(k) or 403(b) savings program in which employees could put a portion of their income into a tax-deferred account.

However, only 60 percent of employees reported that their companies make a contribution to their retirement savings over and above what the employees them-

**U.S. benefits provided by employer**



**U.S. medical insurance programs**

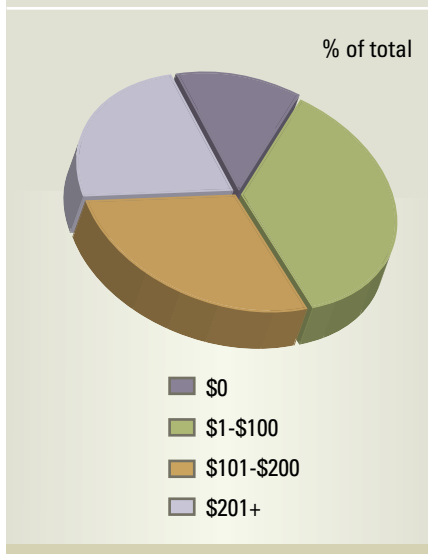


selves put into their accounts. By contrast, only 21 percent reported their companies offering traditional defined benefit plans, or pensions.

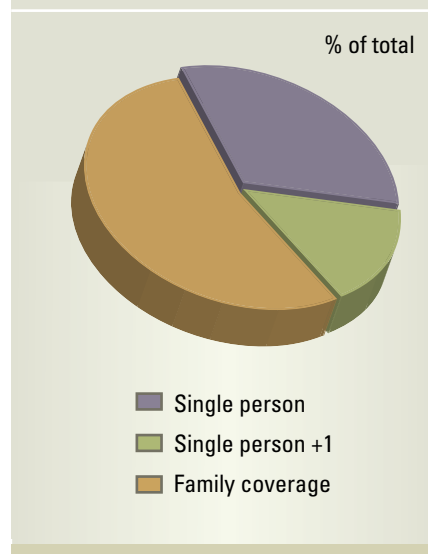
Other types of benefits also proved commonplace. Employees reported that 55 percent of companies offer flexible spending plans, 51 percent offer paid short-term disability, and 47 percent offer employee assistance plans for personal issues. However, paid family leave remains less common, as only 34 percent of employees reported that their companies provide it.

Education reimbursement is widely available, with 50 percent of employees reporting it among their benefit packages. Some form of stock options is available to 33 percent of U.S. employees in micro and nanotech.

**U.S. monthly premium for medical insurance**



**U.S. type of medical coverage elected**



## Hourly wage compensation – U.S.

The compensation survey did not provide enough responses from hourly wage employees to draw conclusions that are as meaningful as those drawn from the responses of salaried employees. However, some trends were nevertheless evident.

There were 64 hourly wage employees in the U.S. on the final list spanning a compensation range from \$6.15 per hour to \$325 per hour.

The average pay per hour was \$88.51, a number that is likely skewed to the high end by greater survey participation from consultants than from hourly technical employees. For example, of hourly employees earning \$100 per hour or more, 47.8 percent classified themselves as the lead executive of a company with 10 or

fewer employees in the consulting/financial services category.

At the low end of the pay scale there was a preponderance of technicians. Of hourly employees earning \$25 per hour or less, 38 percent classified their job title as technician.

There was a generally even distribution of hourly wage employment across age categories and education level. As would be expected, the older and more highly educated employees earned more.

The data clearly show that experience counts. Hourly wage employees who had been in the same position for 11 years or more made on average more than their counterparts who had served less time, as did those who had been with the same organization for more than 10 years.

However, the vast majority of hourly

wage employees have been with their current employers only a short time: a full 75 percent have been with their employers for five or fewer years.

Hourly workers were not without benefits: 53 percent were eligible for benefits through their employers and 39 percent were eligible for dental insurance. As for retirement benefits, 37.5 percent of hourly wage employees said their employers offered a 401(k) or 403(b) retirement plan and most of those employers also offered some form of match.

However, other types of benefits were much less common. Only 12.5 percent of respondents reported that their employers offered flexible spending account options and only 20 percent offered paid short-term disability – compared with 55 percent and 51 percent, respectively, for salaried workers.

## Changes in compensation – U.S.

Micro and nanotechnology employees are an optimistic bunch, an analysis of changes in salary shows. While only 64 percent of U.S. employees received a raise in 2005, 75 percent said they expected to receive a raise in 2006.

The trend was more pronounced among employees who received a raise of less than 5 percent in 2005. While 39 percent reported receiving a raise of less than 5 percent in 2005, 47 percent expected a raise at that level in 2006.

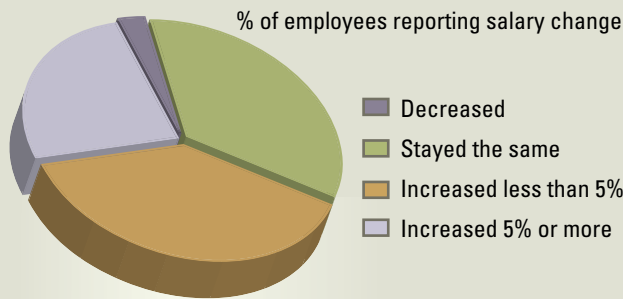
Raises at higher levels were less common and the increase in expectations was not as steep. While 25 percent of employ-

ees reported receiving a raise of more than 5 percent in 2005, 28 percent expected such a raise in 2006.

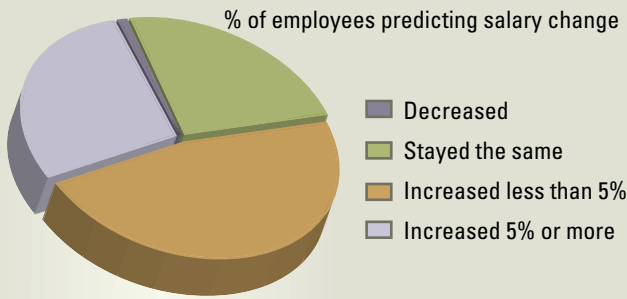
Those who had had their pay cut did not expect it to happen again. Whereas 3 percent of U.S. employees reported a decrease in their salaries in 2005, only 1 percent anticipated a salary decrease in 2006.



**U.S. compensation changes 2005**



**U.S. compensation changes 2006**



**Global trends**

Whereas the majority of survey responses came from the United States, there was still considerable participation from around the globe, including 270 responses on the final list from employees in 36 countries other than the U.S.

India accounted for most of the global participation, with 23.7 percent of non-U.S. participation, and Canada, with 22.6 percent. Western European countries also posted significant participation in the survey, including the United Kingdom with 6.7 percent and Germany with 4.8 percent. Singapore and China were each responsible for 4.1 percent of participation in the survey.

While participation in the survey may say something about the global distribution of micro and nanotechnology employment, too much should not be read into the data. The survey was conducted online and promoted via Small Times' online and print publications, and the geographic response rate to a large extent reflects the online and print readership of Small Times.

However, the survey does provide meaningful data about countries from which employees provided a reasonable amount of information.

In the data coming in from India, for instance, the financial benefits of setting up operations abroad are obvious. The average annual pay of a salaried employee in micro and nanotechnology in India was a mere \$16,508.

The majority of respondents from India classified themselves in the category

of either an engineer, researcher or scientist (43.8 percent of respondents) or as a manager or director of engineering, research or technology (18.8 percent of respondents).

An engineer, researcher or scientist in micro or nanotechnology working in India earned an average annual salary of \$8,898. Pay rates in the category spanned a dramatic range, from a low of \$500 per year to a high of \$120,000 per year. But most salaried employees – 64.3 percent – earned \$10,000 per year or less. Managers or directors of engineering, research or technology in India earned an average of \$15,850 per year.

However, survey data show that those salaries are likely to rise. Of employees in India who reported whether their salary changed in 2005, a whopping 78.9 percent received raises while the remainder reported their salaries staying the same. Not even a single employee reported

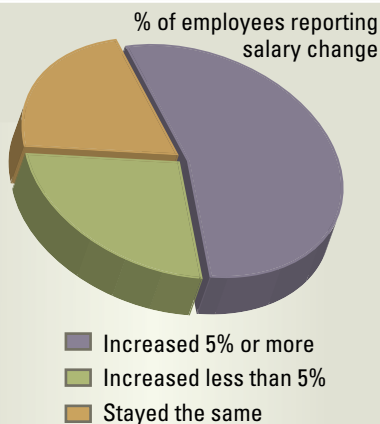
receiving a decrease in compensation.

Of those employees in India who reported salary changes, 54.4 percent had a raise of 5 percent or more. Expectations for 2006 were similarly bullish: A full 81 percent of salaried employees expected a raise of 5 percent or more.

In Canada, the other country from which employees provided a relatively high response rate, the average annual pay of a salaried employee in micro or nanotechnology was \$80,750. Pay ranged from a low of \$15,000 to a high of \$300,000 per year.

Of the total respondents from Canada, 39.3 percent were engineers, researchers or scientists. They earned on average \$48,000 per year. On the executive side, 19.7 percent of respondents from Canada classified themselves as a president, CEO or managing director. They made an average of \$137,500 per year. ■

**India compensation changes 2005**



**India compensation changes 2006**

