

**STATEMENT
OF
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COUNSEL
MOMENTA PHARMACEUTICALS, INC.**

**BEFORE THE HOUSE OF REPRESENTATIVES
SUBCOMMITTEE ON THE COURTS AND
COMPETITION POLICY
OF THE
COMMITTEE OF THE JUDICIARY**

**HEARING: BIOLOGICS AND BIOSIMILARS:
BALANCING INCENTIVES FOR INNOVATION**

JULY 14, 2009

Good afternoon Mr. Chairman and Members of the Committee. Thank you for the opportunity to participate today. I am Bruce Leicher, Senior Vice President and General Counsel at Momenta Pharmaceuticals, a biotechnology company with a breakthrough technology platform for characterizing complex therapeutics and biologics.¹ Momenta's unique capabilities apply to both generic and novel biologics, which means our scientists are exploring both follow-on and novel development by thoroughly characterizing and determining the structure-function relationship of biologics so that their side effects and efficacy can be better understood, controlled and improved.

I am pleased to discuss the important intellectual property issues facing biogeneric and biosimilar products². The differences between the Waxman-Deal (H.R. 1427) and Eshoo-Barton (H.R. 1548) bills³ are critical, and the choices we make today will drive the long-term competitiveness, growth, and health of our biotechnology industry for many years to come. I believe I can offer a unique perspective with respect to both the need for and the protection of intellectual property as it relates to biological products. Serving as counsel to biotech companies for almost 20 years, I have been involved in the development and commercial launch of some of the earliest breakthrough products, including EPO, recombinant factor VIII and IX, Interleukin-11 and 12 and other biologics. I also have participated in numerous

¹ A brief summary of Momenta Pharmaceuticals is attached as Exhibit A.

² We use "biogenerics" to refer to interchangeable generic biologics that have been sufficiently characterized or studied to be interchangeable and substitutable, and "biosimilars" refer to follow-on biologics that are similar but not interchangeable and substitutable.

³ Although not the subject of this hearing, we note that the Waxman-Deal bill as well as the companion Schumer-Vitter-Brown-Collins (S. 726) bill in the Senate contain scientific and regulatory provisions that will promote the development of safe, pure and potent biogenerics and biosimilars while incentivizing innovation by brands and biogenerics alike. While the Kennedy HELP (S. 1695 2007) bill has excessive data exclusivity in our view, its regulatory, scientific and patent clearance provisions would also create the right incentives by allowing the FDA to consider applications based on real data from the date of enactment. It, like Waxman-Deal, lets science drive the process. Additional challenges to innovation with the Eshoo-Barton bill are that it mandates clinical trials, establishes mandatory guidance document requirements, and imposes lengthy waiting periods for filing an abbreviated application. These hurdles would discourage investment in biogeneric enabling technology because one could not obtain approval within a period of time that would warrant the cost of the capital investment.

financings and collaborative research deals between emerging biotechnology companies and large pharmaceutical companies. I have served on product development committees that seek to balance risk vs. reward. I have experienced the joy of meeting parents whose children's lives have been transformed by these products. I have also participated in many of the seminal biotech patent cases that determined marketing exclusivity and the strength biologics patents offer. Last fall, I participated in the FTC Roundtable: "Emerging Health Care and Competition and Consumer Issues" that resulted in the June 2009 FTC Report on follow-on biologic drug competition.⁴ All of these activities imprinted me with a strong sense of biotechnology's contribution to society, how challenging R&D can be, and how rewarding the breakthroughs can be. Our goal should always be to bring safe, effective, and potentially life-saving products to patients and to prime the pump for future discoveries and innovation. And fundamental to achieving and sustaining this mission is the need to provide timely access to affordable medicines, for even the best of medicines are of no value if their high cost puts them out of reach for patients who need them.

I would like to briefly mention three key points that I believe must be addressed in any biogeneric legislation to make it workable and to ensure that it provides the means of achieving the desired goal.

1. The law should include intellectual property features that drive both brand innovation and biogeneric innovation to assure future growth, global leadership and long term biotech competitiveness.
2. The law should avoid needless intellectual property features that erect barriers to generic competition – a proven driver of new drug innovation -- and thereby create an undesired incentive for inefficient and non-innovative R&D spending.

⁴ A copy of Momenta's comments to the FTC is attached as Exhibit B.

3. The law should promote timely access to affordable biogenerics and biosimilars by implementing a patent clearance process that is transparent, efficient and respects the intellectual property rights of both brand and biogeneric companies alike.

These three tenets are critical to establishing a biogeneric approval process that maintains a balance between innovation and access. Because Momenta is both a novel therapeutics company and a biogeneric company, we can attest to the need for such a balance. Moreover, we believe this balance can only be achieved by enacting legislation that takes the Waxman-Deal approach to intellectual property and market exclusivity.

1. Patents are a proven force for driving innovation and speed to market. But more importantly, patents provide at least as much if not more market exclusivity to biologics than drugs and an opportunity to earn a return on investment. Biologics also have far less brand to brand competition during brand life than small molecule drugs. As noted by the FTC, biotechnology products benefit from a complex web of patent rights, including, but not limited to, covering the product, its genetic code, methods to regulate the biologic pathway in which the product is involved, the technology on which it is based, the manufacturing and formulation approach used, and the use of patentable biomarkers for dosing. While some will argue that individual patent claims may be somewhat less certain, the aggregate complexity provides a strong defense in the marketplace. This has been the experience in brand to brand competition and should be expected to continue as biogenerics emerge. Current regulations under Hatch-Waxman already provide patent term extension for up to 5 years to compensate for regulatory approval delays, and this applies to both chemical and biologic drugs. So if aggregate patent protection provides greater market exclusivity, then why should we be considering significantly longer data exclusivity periods for biologics than those for small molecules under Hatch-Waxman?
2. Aside from robust patent protection, there is a far more important reason to appropriately limit data exclusivity: to incentivize innovation and future competitiveness. Consider the effect of extended data exclusivity on R&D

investment decisions. The issue is not whether data exclusivity will trigger substantial R&D investment, but rather what kind of R&D it will promote. Will funding be directed to innovative, patentable discovery of new cures -- the hallmark of biotechnology companies in the 1980s and 1990s? Or, will it instead reward de-risking of product development portfolios by offering exclusivity for the development of non-innovative or “me too” products? From an investment perspective, financial investors are agnostic to the degree of medical need and will certainly drive us toward the lower risk, higher reward development that have extended data exclusivity. By extending exclusivity beyond patent life, we put truly new innovative R&D further at risk, which will delay urgently needed efforts to discover cures for so many unmet needs.

3. Now let's discuss biogeneric innovation and safety. Consider Momenta's experience. Without a biogeneric pathway, Momenta's first application of its technology was to characterize low molecular weight heparin, a biologic-like drug that is regulated under the ANDA pathway. Having an ANDA pathway available made it possible for Momenta to obtain financing and develop its innovative technology to thoroughly characterize the structure and better understand structure-function relationships of heparin, including its potential for immunogenicity. Notably, brand companies assert that this degree of product characterization and understanding is not possible, while continuing to market these products. Having developed the tools for understanding heparin, we are now able to use our technology to understand biologics and develop biogenerics as well. But perhaps most importantly, our technology platform has already contributed to the safety of heparin. Last year, Momenta used its tools to assist MIT and other academic centers in collaboration with the FDA to identify the contaminant in Chinese heparin precisely because it had thoroughly characterized heparin for an ANDA and knew what should and should not be in the product. Thus, biogeneric innovation can play a key role in improving quality control and assuring patient safety. If we and others are barred by data exclusivity or other barriers in the legislation from using our technology, then our opportunity to finance this kind of innovation will be put at risk.

Innovation on the brand and generic side, not just affordability, was the wisdom of the original Hatch-Waxman legislation. Despite claims that Hatch-Waxman would end pharmaceutical innovation, the opposite unfolded, as the biotech industry was launched, as noted by the FTC. As generic products replace mature brands, brand companies are incited to invest in innovative, patentable programs to fill their pipelines. In the absence of generic products, brand companies may find it more economically attractive to de-risk their portfolios because they will not have to compete with generic priced products.

Our concern with Eshoo-Barton bill is that it would do exactly that— namely that it would deter true new drug innovation. Ironically, this would be the complete opposite effect than what supporters of the bill hope to achieve.

1. For starters, Eshoo-Barton creates a complex, lengthy patent clearance process that only begins 3 years before the end of a lengthy data exclusivity period. Because this would not provide sufficient time to complete litigation, it would extend biologic entry well beyond the 12-14 years data exclusivity period in the bill.
2. Unlike Waxman-Deal, Eshoo-Barton includes the entire complex web of biologic patent rights in the clearance process, even if they are not controlled by the brand company. This could double the time and expense for the litigation, including for the courts, and unnecessarily increase the cost of biologics. Waxman-Deal properly limits the litigation to the patents controlled by the brand company. More importantly, patent clearance can be initiated when the abbreviated application is filed by the FDA, providing ample time for litigation before the expiration of the patent rights or data exclusivity.
3. Finally, Eshoo-Barton mandates disclosure of critical confidential information that is not related to proving infringement in the patent clearance process. Just as a brand company is not obligated to disclose its confidential information at the FDA, neither should a biogenerics company, lest we discourage biogeneric

innovation. Hatch-Waxman limited disclosure of confidential information to that needed to determine infringement which properly balanced these interests.

Mr. Chairman, as you and the Committee deliberate over the important issue of establishing a pathway for the approval of biogenerics and biosimilars, you will hear that biologics are complex and generics cannot be safely manufactured. Our experience teaches otherwise.

The wisdom of Hatch-Waxman was that it did not dictate investment decisions; rather it put guardrails or incentives in place that rewarded innovation and assured affordability when products matured. Investment in breakthrough research and the biotechnology industry flourished at that time creating high-paying jobs and critical new cures. As the first generation of breakthrough biologics emerges from patent protection, will we learn from this experience? Will we support legislation like Waxman-Deal that uses the competitive incentive of biogenerics to promote long term competitive advantage, global leadership and job growth? Or, will we ignore this wisdom and allow R&D investment to veer off track?

The bottom line is this: Will we create a fair and reasonable system that balances incentives to innovate with the need for access to affordable medicines, or will we accept a process that entrenches pharmaceuticals profits for less innovative brand research, and do so at the expense of patients in need of less-costly medicines. Will we create a fertile environment for biogeneric companies to invest in the hard science to understand and make biologics and biogenerics safer and better? Will we let the patent system drive efficiency and high rewards for breakthrough biologics as biogenerics provide affordable access to mature products?

As I see it, this is exactly what health care reform is all about.

Thank you for this opportunity. I would be pleased to answer any questions.



Momenta Company Overview

Momenta is a biotechnology company, founded in 2001 based on a technology platform initially developed and licensed from Massachusetts Institute of Technology. We currently employ approximately 175 employees at our offices in Cambridge, Massachusetts. We are applying our innovative technology for the detailed structural analysis of complex mixture drugs to the discovery and development of both novel and complex generic biopharmaceuticals. We leverage this platform to study the *structure* (i.e., thorough characterization of chemical components), *structure-process* (i.e., design and control of manufacturing process), and *structure-activity* (i.e., relating structure to biological and clinical activity) of complex mixture drugs. The development product candidates and research programs from our generic and novel portfolios are outlined below.

Momenta Pharmaceuticals—Product and R&D Pipeline

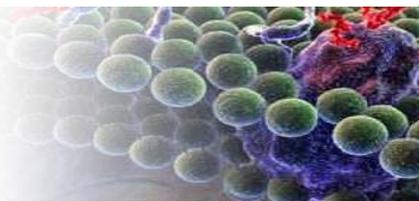
	Complex Mixture Generic and Follow on Biologic Drugs	Novel Drugs
Development Product Candidates	M-Enoxaparin [†] (Generic Lovenox®) M356 [†] (Generic Copaxone®) M178 [†] (Follow-on Biologic)	M118 (Anticoagulant)
Research Programs	Follow-on Biologics (FOBs)	M402 (Oncology)

[†] In collaboration with Sandoz/Novartis Pharmaceuticals

Complex Mixture Generics Portfolio

Our complex mixture generics and follow-on biologics effort is focused on building a thorough understanding of the *structure-process-activity* of complex mixture drugs to develop generic and follow-on versions of marketed products. While tailored specifically for each specific product candidate, we utilize a similar analytical and development approach across all of our product candidates. Our first objective is to apply our core analytical technology to thoroughly characterize the *structure* of the marketed product. By defining the chemical composition of multiple batches of a marketed product, we are able to develop an “equivalence window” which captures the inherent variability of the innovator’s manufacturing process. Using this information we then build an extensive and robust understanding of the *structure-process* relationship, to design and control our manufacturing process to manufacture reproducibly an equivalent version of the marketed product. Where necessary, and as required by FDA, we will supplement our application with additional supportive *structure-activity* data (e.g., immunogenicity, pharmacodynamics). Our goal is to obtain FDA approval for and commercialize generic or follow-on versions of complex mixture products, thereby providing high quality, effective, safe and affordable medicines to patients in need.

Our most advanced product candidate, **M-Enoxaparin**, is designed to be a technology-enabled generic version of Lovenox® (enoxaparin sodium injection), a low molecular weight heparin, or LMWH, used to prevent and treat deep vein thrombosis, or DVT, and to support the treatment of acute coronary syndromes, or ACS. This drug is a complex mixture of polysaccharide chains derived from naturally sourced heparin. An Abbreviated New Drug Application (ANDA) for M-Enoxaparin, submitted in August, 2005, is currently under FDA review. Our second major generic product candidate is **M356**, a technology-enabled generic version of Copaxone® (glatiramer acetate injection), a drug that is indicated for the reduction of the frequency of relapses in patients with Relapse-Remitting Multiple Sclerosis, or RRMS. Copaxone® consists of a complex mixture of polypeptide chains. With M356, we have extended our core characterization capabilities from the characterization of complex polysaccharide mixtures to include the characterization of complex polypeptide mixtures. An ANDA for M356, submitted in December, 2007, is currently under FDA review.



In addition to our two complex generic product candidates, we have further extended our analytical and development platform to pursue generic or follow-on versions of biologic drugs. Our collaborative efforts on **M178**, as well as our ongoing internal **Glycoprotein Research Program**, are focused on developing generic or follow-on versions of marketed therapeutic proteins, which are derived from natural or cell based manufacturing processes. By thoroughly characterizing these biologic molecules, we seek to gain a deeper understanding of the relationship between their manufacturing processes and final product compositions. Our goal is to replicate our development approach with M-Enoxaparin and M356 and pursue the development and commercialization of multiple generic or follow-on versions of marketed therapeutics.

Novel Drugs Portfolio

Our complex mixture novel drug research and development efforts leverage our analytical technology platform and *structure-process* knowledge to develop novel drugs by studying the *structure-activity* of complex mixtures and develop novel drugs. With our capabilities to thoroughly characterize complex mixtures, we are targeting our efforts to understand the relationship between structure and the biological and therapeutic activity of various complex mixture drugs. Our goal is to capitalize on the structural diversity and multi-targeting potential of these complex mixtures to engineer novel drugs that we believe will meet key unmet medical needs in various diseases. While we believe that our capabilities to engineer improved and novel complex mixture drugs can be applied across several product categories with significant therapeutic potential, such as polysaccharides, polypeptides and glycoproteins, our initial focus has been in the area of complex polysaccharide mixtures.

Our lead novel drug candidate, **M118**, is a LMWH that has been engineered to possess what we believe will be an improved therapeutic profile (compared with other currently marketed products) to support the treatment of ACS. We are currently completing a Phase IIa study in patients undergoing percutaneous coronary intervention, or PCI. **M402**, our second novel drug candidate, entered early development this year as a potential inhibitor of angiogenesis and tumor metastasis. We also are seeking to discover and develop novel therapeutics by applying our technology to better understand the function of these polysaccharide mixtures in multiple biological processes, with an initial focus in oncology.

Momenta Technology

Our integrated technology platform for the study of complex mixtures utilizes three different types of analytical tools. First, we have accumulated a comprehensive library of enzymes that we use to break down the components of a complex mixture into smaller, measurable units. Second, we apply proprietary improvements to established analytical techniques (such as Matrix Assisted Laser Desorption Ionization-Mass Spectrometry, or MALDI-MS, nuclear magnetic resonance, or NMR, and capillary electrophoresis, or CE, among others), to gather and analyze information regarding the components, structure and arrangement of the chemical building blocks of the complex mixture. Third, we apply proprietary mathematical methods that integrate the disparate information obtained from these analytical techniques to arrive at a specific, numerically-derived solution that describes the complete composition of a specific complex mixture. It is the combination of these tools that enables us to characterize complex polysaccharide, polypeptide and glycoprotein mixtures.

While a similar integrated analytical approach is applied across different product categories, we develop a unique characterization toolkit for each specific complex mixture. Once the chemical components of the complex mixture are known (*structure*), we (1) further employ these methods and data sets in the design and control of our manufacturing process (*structure-process*) to produce generic versions of marketed drugs, and (2) relate structure to biological and clinical activity (*structure-activity*) to engineer novel drugs which meet key unmet medical needs in various diseases.

Company Contact Information

Our principal executive offices are located at 675 West Kendall Street, Cambridge, Massachusetts 02142, and our telephone number is (617) 491-9700. Our Internet address is www.momentapharma.com.



Submitted in Electronic Form

December 22, 2008

Federal Trade Commission
Office of the Secretary
Room H-135 (Annex F)
600 Pennsylvania Ave, NW
Washington, DC 20580

Re: Emerging Health Care and Competition and Consumer Issues – Comment, Project No. P083901

Momenta Pharmaceuticals, Inc. (“Momenta”) was very pleased to participate in the November 21, 2008 Roundtable on Follow-On Biologic Drugs (the “Roundtable”) at the Federal Trade Commission (the “FTC”). We support the FTC’s initiative to seek public comment and participation, and welcome this opportunity for open dialogue.

There are very important immediate and long term pro-competitive advantages that will result from the creation of an abbreviated regulatory approval pathway for follow-on biologics. We believe that any legislation must provide the FDA with the full authority to approve both Biosimilars and Biogenerics (as defined below) or these benefits will not be fully realized.¹ We also believe the maintenance of the status quo creates an economic environment that discourages innovation and investment in the next generation of quality by design technology. In other words, the absence of an abbreviated pathway for Biogenerics and Biosimilars under current law establishes a legislative barrier to scientific innovation. We are also very concerned that even if legislation is adopted, that several of the procedures and features in the proposed legislation could have the same anti-competitive impact on follow-on biologics as the absence of an abbreviated pathway.

We appreciate your request for supplemental comments and the opportunity to spell out our views as expressed at the Roundtable. Our comments are focused on three key points:

¹ A review of the comments submitted prior to the Roundtable as well as the questions and comments raised at the Roundtable, suggests that many of the articulated positions of the pharmaceutical and biotechnology industry are based on the assumption that follow-on biologics will by definition be Biosimilars and not Biogenerics. While we recognize that many product definitions are used when discussing follow-on biologic products, we believe, as the FTC suggested at the Roundtable, that it is appropriate to use two terms “Biogeneric” and “Biosimilar” in an effort to more accurately understand the impact of Biogenerics and Biosimilar products in the marketplace -- Biogeneric products being those follow-on biologic products that are approved and designated interchangeable to the innovator product, with Biosimilar products being those follow-on biologic products approved but not designated by FDA as interchangeable to the innovator product (e.g., Omnitrope®).

- An abbreviated pathway for both Biosimilars and Biogenerics will create an immediate pro-competitive impact by spurring investment in innovative research and development, promoting quality improvement, and creating the opportunity to control costs for payors while improving access for patients to brand and follow-on products alike.
- The proposals to extend data exclusivity periods for brand biologics should be carefully examined to preserve innovation and encourage investment in basic research, cures and unmet medical needs. A careful examination will reveal that the existing patent regime and patent term extension rules are as protective and in many respects more protective of reference brand biologic products than the protections afforded reference brand small molecule products, making the need for greater exclusivity open to question; and
- It is essential to ensure that the patent resolution process is transparent, efficient and does not create anti-competitive barriers to market entry.

1. There are Immediate Important Pro-Competitive Market Impacts that will result from the adoption of a Biogeneric and Biosimilar Regulatory Pathway.

- a. Momenta offers a case study of how research and development of follow-on biologics will spur innovation and create an immediate pro-competitive impact that will facilitate quality improvements, price competition and investment in research and development of therapeutics for unmet medical needs.

Momenta was formed to develop the next generation of characterization technology and overcome the technical barriers that impeded the scientific understanding of complex molecules and proteins. Our initial goal was to unravel and thoroughly characterize the chemical structures of these important complex molecules to gain insights into their biological activity and the process for manufacturing them. Over the past 6 years, Momenta pursued these goals, and expanded its capabilities for understanding of complex polysaccharide, polypeptide and protein drugs.

Our initial work was to develop technology and analytic tools to develop generic versions of complex products that can be filed as traditional abbreviated new drug applications or ANDAs. A second area involves applying our understanding of chemical structures to unlock the biology of complex mixtures and engineer novel new drugs. Our third area of research and development is applying our innovative analytical technology to the development of follow-on biologic products. Our complex generics pipeline includes M-Enoxaparin and M356, which are partnered with Sandoz, a division of Novartis. M-Enoxaparin, a generic version of Lovenox® (ANDA filed in August, 2005), and M356, a generic version of Copaxone® (ANDA filed in December, 2007), are currently both under review at the FDA. These complex mixtures were once thought to be impossible to characterize thoroughly and manufacture reproducibly. Our investment in characterization and analytical tools has resulted in two ANDA filings to date, and each program represents an example of the kind of innovative research and investment that could

be further encouraged with the creation of an abbreviated regulatory pathway for follow-on biologics. Had the Hatch-Waxman pathway not been available for the review and approval of these kinds of products, Momenta would have been unable to raise the capital to undertake these programs and enter into a collaborative partnership to finance the research and development to substantially improve the quality of complex mixture and protein products, and gain more knowledge and insights into these complex molecules.

The results of this work have already led to important short term benefits. In the past year, we collaborated with FDA and other academic institutions in helping to resolve the global heparin contamination crisis. Through the use of our innovative analytic approach, we aided the FDA in identifying the nature and the source of the contaminants in the heparin imports, and through our expertise in disease biology we helped to establish the biological plausibility linking the contaminant to the observed adverse event profile. See Gerrini et al., "Oversulfated chondroitin sulfate is a contaminant in heparin associated with adverse clinical events," *Nat Biotechnol.* 2008 Jun;26(6):669-75. Epub 2008 Apr 23 and Kishimoto et. al., "Contaminated Heparin Associated with Adverse Clinical Events and Activation of the Contact System," *N Engl J Med.* 2008 Jun 5;358(23):2457-67. Epub 2008 Apr 23.

With this in mind, we have also invested heavily in adapting our technology and our tools to characterize proteins with the intent of creating follow-on biologic, or protein products. Our investment in this area enables the potential to characterize thoroughly protein products. Historically, due to the lack of more advanced analytical tools, proteins have not been fully characterized and are defined in large part by their manufacturing process. These new tools can enable thorough characterization and offer the very real potential to develop equivalent, substitutable versions of protein products.

These tools also offer the opportunity to significantly add value and cost savings to the innovator drug development process. As the technology is developed to allow for thoroughly characterized proteins, brand manufacturers will have an incentive to use these technologies to enhance the quality of their products by more precisely controlling variability of a number of attributes in the final drug product. They would also be able to apply the technology to the qualification of new manufacturing facilities and product enhancements, and reduce the need for very costly, potentially unnecessary clinical trials. Today, brand biologic products undergo very expensive clinical testing to evaluate safety and efficacy, but clinical trials are not necessarily the most useful, effective or ethical means for identifying low frequency risks such as immunogenicity or the risks of product contamination. As the features and complex differences in complex drugs and protein products are characterized, the risks that are associated with immunogenicity can be avoided by design, contaminants detected, and the cost of unnecessary clinical trials avoided. These are real and significant quality improvements and cost savings. To the extent that new technology will more thoroughly characterize follow-on biologics and allow for the establishment of equivalence and interchangeability, then it would be unethical to run clinical trials because of the needless delay in bringing these products to market. The net result of a delay in approval is to preserve the existing monopoly for the branded product and further impede access to these more affordable and potentially life-saving medications. Instead, the

potential for follow-on biologic competition would shift investment bias at brand companies more in favor of products addressing new unmet needs and discovery research into new cures.

Consider the emergence of the biotechnology industry. In the early 1980s, there were calls for restrictions on the use of recombinant DNA technology in the development of therapeutic proteins. Claims of safety risks and uncertainty about cloning were made, but reason prevailed and restrictive legislation was not adopted to stifle these important scientific advances. Had these voices prevailed, the industry would not have attracted the necessary investment capital to develop the first generation of recombinant therapeutic proteins. Just as legislation at that time restricting such research and development or the ability of the FDA to regulate and approve recombinant proteins was unwarranted, today, as the first generation of therapeutic proteins approach the end of their patent terms, legislation should not block or inhibit the development of characterization technology and quality improvements that make it possible to develop safe and effective Biogenerics and Biosimilars.

Consider the state of the pharmaceutical industry prior to the adoption of Hatch-Waxman. It was focused on assuring quality and innovation, for sure, but its investments and resources in the 1970s and early 1980s may have focused less on higher risk discovery of new therapeutics, and perhaps more on lower risk development of two, three or four competing therapeutics in a class as well as on product life-cycle management strategies. Hatch-Waxman created a transformation in the pharmaceutical sector. By facilitating the pro-competitive launch of generics, the profit associated with multiple drugs in a class or in life extension strategies was reduced as products approached the expiration of their patent life, and the *relative* profit associated with the development of innovative new therapeutics increased. The biotechnology industry emerged, and the pharmaceutical industry invested heavily in the 1980s and the 1990s in biotechnology, in biology as a basis for screening small molecule libraries of compounds and in the field of rational drug design. We believe that Hatch-Waxman played a significant role in this transformation of research and development in the pharmaceutical sector (i.e. that the reality of fair and appropriate generic competition contributed to this change in behavior).

The enactment of an abbreviated pathway for approval of Biosimilars and Biogenerics offers a similar opportunity for transformative change. Today, biotechnology and biopharmaceutical companies focus their investment in characterization technology for quality assurance purposes, but limit their research and development into thorough characterization of biologics. This leads to the belief that biologics cannot be thoroughly characterized, that Biogenerics are not feasible and that Biosimilars will offer limited competitive advantages. Aside from their vested interest in this view, we believe that the history of Hatch-Waxman proves the contrary. We believe that once the pathways are in place, there will be an immediate competitive impact on research and development at biotechnology and biopharmaceutical companies who will see the competitive advantages of product quality improvement. We also note with interest the fact that many large pharmaceutical companies such as Merck and Lilly have recently announced their intention to pursue the development of follow-on biologics. Federal policy should support this competitive change.

The absence of an abbreviated pathway for FDA approval of Biosimilars and Biogenics is also the key challenge facing us, and innovator companies like us. While we believe our work with M-Enoxaparin and M356 has demonstrated the power of our technology to make abbreviated pathways possible for complex mixture based drugs, and that our on-going work on proteins indicates that the same should be possible with follow-on biologics, the absence of unambiguous legislation authorizing the FDA to implement an abbreviated pathway may be the rate limiting factor restricting availability of investment capital for us and companies like us.

The enactment of an abbreviated pathway is thus essential to open the doors for competition and encourage innovation by Momenta, companies like Momenta, and brand biotechnology companies alike. As the technology develops, we believe it will significantly reduce the cost of drug development and ultimately result in improved patient access to high quality, safe, effective, and potentially life-saving medications at a more affordable price. We also believe that the FDA is fully qualified to evaluate the emerging product and process characterization technology and must have the discretion to review each follow-on biologic application based on the science presented. This will facilitate the entry of generic biologic competition while assuring the highest standards of product quality to ensure patient safety. We consider ourselves to be an innovator company and are concerned that some of the more traditional innovator companies are seeking to erect legislative, regulatory, and market barriers to legitimate, technology based competition. Opening the door to such innovative analytical science, will also improve the quality of both innovative and generic drugs in the future.

- b. Biogenics, in particular, offer a significant pro-competitive opportunity, and it is essential that any legislation provides the FDA with discretion for approval of Biogenics as well as Biosimilars to ensure these benefits accrue to patients.

If one only anticipates the development of Biosimilar products, then it is conceivable that absent interchangeability, there will be higher development costs than those incurred in the traditional generic drug marketplace, and thus, less cost savings. Similarly, if one relies on clinical trials to demonstrate “similarity” rather than “sameness” to obtain approval of a Biosimilar, then one would not expect there to be a significant incentive to develop improved characterization technology that would allow for incorporation of quality by design into the product. In addition, one would continue to expect significant continued spending on sales and marketing activities to promote Biosimilars because they would not be interchangeable.

On the other hand, if one anticipates the development of Biogenics and grants the FDA discretionary approval authority, the analysis presented in the comments of many of the biotechnology companies and pharmaceutical companies warrants further scrutiny. First, and perhaps foremost, as noted above, the mere potential for Biogenics will stimulate significant investment in innovation. This investment will lead not only to the cost saving benefits of Biogenics themselves, but to significant advancement in the technology used by the pharmaceutical and biotechnology industry to characterize and develop all biologics. Previously unknown contaminants and features of complex molecules will begin to be better understood, and engineered out of final products during the development process. The need to rely on

clinical trials to establish comparable efficacy and safety as well as to avoid the risks of immunogenicity could be reduced and potentially avoided. As noted above, Momenta has begun to demonstrate these innovations in the field of complex generics where the ANDA pathway is available and has enabled Momenta to raise investment capital and apply these new skills. The authorization of the FDA to approve Biogenerics, based on its scientific discretion, will, we believe, stimulate brand and generic companies alike to develop the necessary tools and technology to create the opportunity for Biogenerics in the future.

In the mid-term, we also anticipate that these new tools and technology will accelerate development of Biosimilar products. As the technology advances, the extent of clinical testing may vary based on a company's characterization capabilities. In addition, brand companies seeking to expand or improve manufacturing capacity (and patients in turn) will benefit from cost reduction to the extent characterization similarly reduces the need for clinical trials.

In the longer term, when Biogenerics are approved and interchangeable, the benefits of the price reductions associated with avoiding unnecessary clinical development costs and a generic marketing and pricing model will offer the greatest economic benefit to payors and patients. We do agree however that because of the complexity of demonstrating "sameness" for interchangeability, fewer Biogenerics will enter the market than in the traditional generic drug marketplace, and that price reductions for Biosimilars and Biogenerics may not be to the same degree as for small molecule generics. Ultimately, the greater the incentive offered by the pathway, the greater the likelihood more companies will invest in Biogenerics. The more companies that invest in Biogenerics, the more competitive products will emerge. To suggest as some participants at the Roundtable did, that pricing would decline by only 10% seems to be well below what we would expect. We believe that one could assume at least 30-40% discount and as the technology develops and the number of market participants increase, and as the number of competitive products increase, discounts may further increase.

In summary, we see immediate, mid-term and long-term advantages to the creation of an abbreviated approval pathway for Biogenerics and Biosimilars. While Biosimilars are more likely to emerge in the next 0-5 years, and Biogenerics in the next 5-10 years, the immediate approval of a Biogenerics pathway will spur real time investment in new quality-enhancing, cost-saving technology that will benefit patients and enhance the development of innovator products and Biosimilar products alike.

2. Data Exclusivity Should be Carefully Prescribed to Avoid Stifling Innovation.

We believe a balanced discussion of data exclusivity at the Roundtable may have been impaired by the separation of the discussion across multiple panels. One needs to consider data exclusivity in relation to the investment decision of brand companies, the relative patent strength of the innovator products as compared to brand drugs, and the existence of the right to challenge the patent rights during the exclusivity period. In addition, by examining these points separately, important distinguishing factors between Biosimilars and Biogenerics may have been overlooked that are important to this analysis.

First, we believe that Professor Brill identified a critical issue for consideration by the FTC and the Congress in his review of Professor Grabowski's analysis of breakeven periods for biologics. The fact that Professor Grabowski's analysis assumes that sales of the innovator brand product essentially end upon expiration of data exclusivity is not a reasonable assumption. We agree with most panelists that anticipated market share for Biosimilars and for Biogenerics will not interfere with continuing and robust innovator brand sales after the expiration of a data exclusivity period -- particularly during the first few years following expiration. Consequently, the breakeven point will be significantly earlier than 12.9 to 16.2 years posited by Professor Grabowski. We agree with Professor Brill that appropriately accounting for these continuing sales suggests that a data exclusivity period of 7 years is sufficient to provide a return on investment. This is because he estimates they will have at least 10 years of revenue (3 years beyond a 7 year data exclusivity period) which is a much more realistic assumption. It is important to note that "breakeven" is not the point at which profits begin to be earned. Rather it is the point at which the expected rate of return (i.e., profit) from an investment along with return of principal is recovered. Moreover, this is only the breakeven point, and we believe that sales of the innovator brand product will continue well beyond this 10 year period as well.

Second, a principal assertion made by several companies filing comments and by the panelists at the Roundtable was that a longer period of data exclusivity is warranted for follow-on biologics than for generic drugs under Hatch-Waxman because biologic patent rights are somehow weaker than small molecule drug patent rights. This claim is made despite the record of broadly issued patent rights on biologics that even the panelists admit, for the first generation of protein therapeutics and antibodies are broader and more complex than small molecule patent rights. The patent filings relating to the biology in which a biologic product acts include, but are not limited to claims drawn to:

- The target receptor or biologic pathway
- DNA encoding the receptor or the ligand to the receptor
- The cloned protein itself
- A Monoclonal antibody which binds to the receptor and regulates the receptor or biologic pathway
- Generic therapeutic claims for treatment of a disorder resulting from regulation of the receptor or pathway

In other words, the discovery and understanding of the biology of a pathway often allows for patent protection that not only covers the therapeutic protein or antibody itself, but offers the potential to claim coverage of other therapeutic proteins and antibodies that regulate the biological landscape in which the biologic acts.

In addition to this broader range of patent coverage for biologic products, there are frequently technology platform patents and manufacturing patents that result from biological understanding that may be essential to using the biologic. These might include patents covering the process for production of antibodies or proteins in general; processes for controlling the

shape or structure of proteins or antibodies to reduce the risk of side effects, or patents for increasing the efficiency of production or the purification of the protein or antibody. Unlike small molecule drugs, these patents often provide a level of market protection because the biological origin of their discovery makes them necessary for production of a product.

Contrast this patent landscape with those for small molecule drugs. In most cases the small molecule is discovered by screening against a target or receptor in a pathway and the patent rights are generally limited to the composition of matter of the molecule, its method of manufacture and its method of use. Thus, while the patent may be strong in terms of its validity, its coverage would not generally block another small molecule that is screened that regulates the same target or has the same therapeutic effect. This is a key point frequently omitted in the discussion. That is why there are multiple small molecule brand products while there are rarely, absent a license agreement or collaboration, multiple brand biologics (e.g, contrast statins with EPO or G-CSF). This means that brand biologics, unlike brand small molecule products, have less competition during the period of exclusivity, and thus a much greater potential to earn a profit in a shorter period of time. Finally, because many biologics emerge from early stage research at Universities and biotechnology companies before they are launched by a fully-integrated biopharmaceutical company, one still may have to obtain licenses for some of the non-product specific patent rights to launch a follow-on biologic.

The result is that follow-on biologics face a much more complex, and broader array of patent rights than one typically faces with respect to launching a small molecule generic.² Given this set of circumstances, it is not clear why there should be a data exclusivity period for follow-on biologics that exceeds the exclusivity period provided for under Hatch-Waxman. This is particularly true given that the innovator companies have been able to take full advantage of the existing patent term extension provisions in the law that permit extensions of up to 5 years (not to exceed 14 years from approval) for delays in the regulatory approval process.³ The patent term extension provisions were added to the patent laws as part of Hatch-Waxman for *both* small molecule and biologic products. The right to challenge patents prior to submission of an ANDA was only added to the patent laws for small molecules, not biologics. Thus, not only is there an

² Several panelists that asserted the “weaker position” of biologic patent rights, conceded at the Roundtable that the first generation of biologic product may have very strong and broad coverage and that could account for many of the products having successfully prevented new entrants for periods exceeding 18 years (E.g. EPO, G-CSF). They noted that the Court of Appeals for the Federal Circuit has restricted the ability of innovators to seek the full breadth of coverage afforded the first generation of recombinant proteins and antibodies. That said, the opportunity to obtain a broad array of patent rights covering a biological pathway is still available for novel inventions, and the fact that the courts have curtailed over-expansive patent claims does not mean that the rights are weaker than those afforded small molecule products. For example, the screening of a small molecule in a pathway may not afford coverage over all small molecules that regulate that pathway today, but the invention of a protein or antibody that is integral to the biology of a receptor pathway might still result in claims covering all proteins or antibodies with similar sequences that regulate the receptor pathway.

³ At the Roundtable, Hospira noted that brand companies are continuing to prosecute so-called “submarine” patent applications on many first generation brand products that are timed to issue on expiration of the core brand product patent estates resulting in 20 years or more of market exclusivity for these products and that this has impacted several of their follow-on biologic programs.

opportunity to obtain stronger patent rights today for biologics, but there is no opportunity for an early challenge to those rights by a developer of a follow-on biologic. The absence of a timely right to challenge questionable patent rights tilts the playing field and restricts competition.

Several panelists took the position at the Roundtable that the European model of 8+2+1 had worked effectively and should be considered as support for a 12-year data exclusivity period. A key difference in Europe, however, is that a follow-on biologic developer is able to file an opposition to the patents and clear the path at any time after the patent issues for publication. Early publication of patent applications providing notice to third parties was the historical practice pre-GATT in Europe. This right to challenge early in the life cycle of a product (and before a filing for approval) adds balance to the European approach. Moreover, in Europe, the regulations and guidance do not contemplate the approval of Biogenerics, only Biosimilars. To the extent that a product is different than the brand product, the differences may take it outside the scope of the patent rights for the brand product and thus affords less patent coverage. This would not be the case with a Biogeneric. In theory, valid, enforceable patent composition of matter biologic patent rights should be as strong as any small molecule rights, because, by definition, it will be the same product. The choice of a regime which affords 8+2+1 years of data exclusivity was predicated on the early stage right to challenge the patents and the potential for less patent coverage on a Biosimilar.

Stepping back, we believe that Hatch-Waxman has demonstrated a reasonable period for Biogeneric product data exclusivity as long as there is a reasonable period for bringing a patent challenge prior to approval. We also believe that taking into account Professor Brill's analysis; it appears that data exclusivity for Biosimilars of up to 7 years may be warranted to accommodate the rate of return on investment. The proposals for 12-14 years of exclusivity, however, in light of the significant patent protection available to biologic products, is unwarranted and not needed to encourage new product innovation. A 12-14 year data exclusivity period would serve instead to extend the time for launch of competitive Biosimilar or Biogeneric products and would create a significant disincentive to investment and defer the economic benefits of follow-on biologic competition, and in particular, the timely market entry of more affordable and potentially life-saving follow-on products.

Finally, we believe it is also essential, and there appeared to be general consensus on the panel, that regardless of the data exclusivity period, a minimum of a four (4) year period is needed in advance of expiration of any data exclusivity period to allow for legal clearance through litigation. The complexity of the biologic patent rights, and the experience with prior litigation of biologic patent rights means that a shorter period would likely lead to a delay in launch for a follow-on biologic beyond the exclusivity period.

3. It is Essential to Ensure that the Patent Resolution Process is Transparent, Efficient and does not Create Anti-Competitive Barriers to Market Entry.

An early and clear resolution of patent disputes is essential to encourage investment in follow-on biologics. The process established under the current Hatch-Waxman procedures

balances the need for investment with the need to protect innovator patent rights.⁴ Under the current process, a generic ANDA filer must certify to the non-infringement or invalidity of publicly disclosed patent rights. The reference brand product owner must then either file suit in response to the filing or the FDA can proceed with the review and approval of the application. This avoids putting the FDA in the position of determining patent rights – an expertise beyond its traditional area of experience. If suit is filed, a 30 month stay issues that sets the time period for litigating the case. The stay is lifted if the suit is resolved sooner and the FDA can then proceed. If the suit continues after the stay expires and the ANDA is approved, then the generic applicant can decide to launch “at risk” or await the outcome of litigation before launching.

While we do not object to the use of an Orange Book process for follow-on biologics, we do not see the need to entangle the FDA in the process and we recognize that it may create a number of unintended, undesirable consequences. For this reason, if an alternative process can be enacted for follow-on biologics that is transparent, efficient and is de-coupled from the FDA review process we would support the alternative approach as well. Our primary concern, however, is that by developing an alternative process, proposals will be made that are designed to use the legislative process to enact procedural barriers that could delay entry of follow-on biologics and undermine their pro-competitive effect. In the end, any approach must assure that upon expiration or termination of the reference biologic patent rights, or an acceptable data exclusivity period, the follow-on biologic is not further delayed, but launched. Invalid or unenforceable patent rights must not be able to delay competition beyond a pro-competitive exclusivity period.

A key question raised at the Roundtable was whether the complexity of the patent rights warranted additional procedural protections to assure that the patent clearance process respects the patent rights of reference brand biologics while assuring the pro-competitive advantages of a timely launch of a follow-on biologics. We agree with the panelists that biologic patent rights are often more complex and often cover patents methods of use and production that involve platform technology and biological pathways. We also agree that frequently the patent rights covering a biologic are in-licensed by the brand manufacturer and are owned by a biotechnology company, a University or the U.S. Government, and that multiple players are involved. While this adds some complexity we believe this can be addressed in the legislation in the first instance

⁴ One should note that when the pharmaceutical industry submitted to the FTC its White Paper on “The Intersection of Intellectual Property and Antitrust Law” (April 22, 2002), a principal theme asserted was that the Hatch Waxman regime provides the essential balance and opportunity to challenge brand patent rights, and thus makes the strong intellectual property rights pro-competitive under the antitrust laws. Now that a similar regime is being considered for legal clearance of follow-on biologics, the same arguments should apply to follow-on biologics to assure a balanced approach. For example, in the White Paper, PhRMA notes that the failure to resolve patent issues prior to product approval presents problems for both the brand and generic manufacturer alike. *Id.* At 17. Similarly, the White Paper notes that the interests of competition are served under the antitrust laws because of the remedies available for abusive patent prosecution, including affirmative defenses of non-patentability, inequitable conduct, or fraud on the patent office. *Id.* at 44-46.

by limiting the legal clearance process to patent rights that are owned or controlled⁵ by the reference brand biologic manufacturer, and leaving it to follow-on biologic company to clear on its own patent rights that are not owned or controlled by the reference brand manufacturer. We are concerned, however, that if all patent rights have to be cleared in the legislative litigation clearance process, that the number of potential patents involved might make the legal clearance pathway unworkable and create an insurmountable barrier to market entry. Limiting it to the rights owned or controlled by the reference brand biologics manufacturer leaves the follow-on biologic manufacturer freedom to conduct a customary patent search, identify the patent rights filed that may be applicable to its product, its manufacture and launch, and then determine how to best proceed.

A second key question raised is when should an artificial act of infringement be created and how should the legal clearance process work. Hatch-Waxman has a 5-year data exclusivity period and permits the filing of the ANDA up to one year prior to the expiration of data exclusivity. The generic manufacturer then can elect, if the patent rights are questionable, to make a certification that the patents are either not infringed or invalid and initiate litigation or await patent expiration. If the same data exclusivity periods are used, we believe the period should be increased to more than one (1) year prior to the end of data exclusivity to allow for completion of the litigation. If, however, an alternative approach is taken that affords greater periods of data exclusivity, then we believe that it is essential to assure and provide for the artificial act of infringement to occur at least four (4) years prior to expiration of data exclusivity. As proposed at the Roundtable, one would anticipate litigation lasting four (4) years in biologic patent. The brand manufacturer is protected because in the unexpected event that the litigation ends sooner, the data exclusivity period would restrict launch until the end of the four (4) year period.

A third key question raised was how should the legal clearance process operate if the Orange Book is not utilized. First, it is important to note that Hatch-Waxman was designed prior to the adoption of the rules requiring publication of patent rights in the United States. Prior to this rule change, it was possible to maintain pending patent applications for extended periods of time and surprise potential infringers despite conducting a thorough patent search. Today, there is greater transparency. We believe the legislation should assume that a follow-on biologic manufacturer is able to conduct its own patent search and be in a position to initiate the process at the time an abbreviated application is filed. We believe that the following process would

⁵ Control generally takes the form of an exclusive license, however, to avoid gaming we believe the concept of control is necessary so that any contractual arrangement, even a non-exclusive license, that restricts access to the patent rights by a third party is covered by the process. Control might take the form of restricting the grant of a license to a third party or the right to sue third parties, or the form of contractual provisions that have economic or commercial terms with the same purpose or effect. If a University, for example, holds a manufacturing related patent right that is available for license to the follow-on biologic manufacturer without any restrictions to the reference brand manufacturer, then a license would generally be available and need not be included in the process. If a reference brand manufacturer controls a University patent right, then the University's patent right should be part of the legal clearance process.

provide a timely, efficient method for legal clearance of patents that are owned or controlled by a brand biologic manufacturer.

- The follow-on biologic applicant, upon filing its abbreviated application with the FDA, sends a notification (a “Notice”) to the brand reference biologic manufacturer and either certifies its intention to delay marketing of a Biogeneric or Biosimilar product until patent expiry or any data exclusivity, or if appropriate, a certification of non-infringement or invalidity. The Notice should contain a list of the patent rights of which the follow-on biologic manufacturer is aware that it believes should be the subject of the legal clearance process, and a level of disclosure similar to the existing Hatch-Waxman notification process.
- Within ten (10) days of receipt of the notice, the referenced biologic drug manufacturer should be obligated to identify any other patents it owns or controls that cover the referenced product (and any subsequently issued patents within a reasonable period of time).⁶
- The referenced biologic drug manufacturer must then be obligated to sue or should be estopped from bringing suit on the identified, challenged patents no later than 45 days after receipt of the Notice. Alternatively, the applicant should have an express right to declaratory judgment jurisdiction if the referenced biologic drug manufacturer does not sue with respect to the patents listed in the Notice.
- Third party patent rights should be included only to the extent they are owned or controlled by the reference brand biologic manufacturer.

We believe this process balances the rights of reference brand biologic manufacturers with the precompetitive objectives of follow-on biologics manufacturers. It allows for follow-on biologic companies and their investors to evaluate the patent risk, and in cases where patent rights are weak, proceed with a well-defined process to obtain approval. If a different process were adopted for follow-on biologics, it would create further uncertainty and the opportunity for litigation that could delay new entry of competition and reduce the incentive for investment.

Conclusion

We appreciate the opportunity to submit these additional comments. We welcome further discussion, recognizing that there are multiple positions being offered on these complex issues. We remain committed, however, towards supporting final legislative language that will provide incentives for companies to compete and innovate, meet the appropriate high quality standards as set by FDA, and bring safe, affordable medicines to patients in need.

⁶ Because the brand reference biologic manufacturer is not necessarily aware of the manufacturing process or formulation used by the follow-on biologic manufacturer, it should not be obligated to identify manufacturing patent rights that could not in good faith have been identified from the information provided by the follow-on biologic manufacturer in the Notice. This also avoids a need for disclosure of the follow-on biologic product information or manufacturing process prior to the initiation of or outside the protection of protective orders issued under any resulting litigation. The burden can be placed on the follow-on biologic manufacturer to conduct a freedom to operate search and to include any such patents in its Notice should clearance be needed.

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Office of the Secretary
December 22, 2008
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If you have any questions regarding our submission, please feel free to contact me at 617-395-2786 or our Chief Operating Officer, Steve Brugger at 617-395-5105. We would be very interested in meeting with you at your convenience in January to discuss our proposals further with FTC Staff.

Sincerely,

A handwritten signature in blue ink, appearing to read "B. Leicher", with a long horizontal flourish extending to the right.

Bruce A. Leicher
Sr. Vice President and General Counsel

Cc: Steve Brugger