Annex 1

Report and Analysis of Measures in Brazil to Improve Quality and Competitiveness in Pharmaceutical Development and Production: A Preliminary Report

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USAID - Colombia MIDAS

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Organization of this report:

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1. Objectives of the Study

The USAID-Colombia MIDAS project on transfer of technology in the pharmaceutical sector includes several components relevant to this preliminary report regarding the situation in Brazil. These are:

a. A comparative assessment of measures taken by three other countries with situations comparable to Colombia to improve research, development and production capacity in the pharmaceutical sector;
b. Identification of potential specific transfer of technology opportunities for local Colombian pharmaceutical enterprises; and
c. Identification of potential specific transfer of technology opportunities for Colombian universities and research institutions.

The ultimate objective of this project is to recommend measures or mechanisms that may improve the international competitiveness of the local Colombian pharmaceutical sector, as well as to identify specific collaboration opportunities for business and research institutions in the pharmaceutical sector.

2. Preliminary Aspect

As noted above, this project proposes to compare three countries at situations relatively comparable to Colombia. This preliminary report focuses on Brazil. It results principally from an on-site visit and interviews. A number of documents with respect to the Brazilian pharmaceutical sector are included as annexes. However, because the results of this report are to be folded into a subsequent comparative study, the discussion here of policy conclusions and recommendations for Colombia is limited. Nonetheless, certain preliminary observations are made.

3. Research Process

The author of this report identified Brazil as a country relatively comparable to Colombia which has taken substantial measures to improve the international competitiveness of its research and development (R&D) and production capacity during the past decade. As an expert on regulation in the pharmaceutical sector, the author was aware that the Brazilian government has made substantial investment to promote R&D, inter alia, through one its national research foundations (Oswaldo Cruz Foundation or FIOCRUZ) and its universities. In addition, it is well known that the government of Brazil (federal and state) operates a system of national pharmaceutical production facilities (Far Manguinhos). What is less well-known is the extent to which the Brazilian regulatory structure has encouraged (or discouraged) development of the local pharmaceutical industrial sector, and to what extent collaboration between research institutions, national producers and the private sector exists and is encouraged. The author of this report considered that the best mechanism for assessment of the situation in Brazil would be to interview individuals directly involved in the Brazilian government and pharmaceutical sector. In addition, on the ground discussions in Brazil would permit the author to explore potential avenues of collaboration for Colombia.

4. Interviews Conducted

Although the time period between formal approval by USAID and the author's visit to Brazil was short[1], the author received notable assistance from Mr. Marcos Oliveira, Vice President and Director of Studies of Abifina (Brazilian industry association for fine chemicals and biotechnology), in the organization of a highly productive meeting schedule in Río de Janeiro from February 22 through February 27.

The interview summaries are organized by subject matter, rather than chronologically, although the date and time of the meetings are indicated. The first group of interviews relate to practical aspects of pharmaceutical research and production. The second group of interviews relates to potential policy, research and academic collaboration.

i) Practical Aspects of Pharmaceutical Research and Production

<u>Meeting of February 22, 2007 (2:30 p.m. – 5:30 p.m.)</u>

[1] Approval February 6, departure from the US on February 21, 2007.

Marcos Henrique de Castro Oliveira, Vice President for Studies and Planning, Abifina, Rio de Janeiro

Roberto Nicolsky, Director General, PROTEC (Sociedad Brasileira Pró-Inovação Tecnológica), Rio de Janeiro

Denis Borges Barbosa, Attorney, Intellectual Property, and Professor at several universities in Rio de Janeiro

Roberto Nicolsky initiated a theme which would be discussed in further interviews. In Brazil, government policy presently directs most of its R&D funding to universities and institutes as incubators for new technologies in the pharmaceutical sector. However, there is very limited linkage between university-institute research and private industry. His view is that this structure is fundamentally wrong and is in large measure responsible for the comparatively low level of innovation and patenting in the Brazilian pharmaceutical sector. He noted that while Chinese and Indian enterprises have significantly increased the number and rate of patents filed in the United States since 2001, Brazilian patenting has decreased. In the period 2004-2006, there was a 10% decrease in Brazilian patenting in the United States as compared with 2001-2003.

Marcos Oliveira observed that Brazilian pharmaceutical production capacity was very strong in the 1950s. At that point, the government elected to direct research and development funding to the universities and away from industry. At present, the local chemical and pharmaceutical industry is two or three technological generations behind the world leaders. He believes that Brazil should model its development policy on that of Korea, which emphasized reverse engineering. In the 1970s and 1980s innovation in the Brazilian pharmaceutical sector largely was derived from inward technology transfer.

Today, fiscal incentives for the pharmaceutical sector are supplied by the government through tax exemptions, tax credits, etc. BNDES is providing funding through loans and equity participation (BNDES is discussed in more detail later in this report). FINEP provides financing for research and basic and engineering design at low interest rates. This year FINEP started a program which includes subsidies. There is, however, some lack of coordination because BNDES is part of the Ministry of Industry while FINEP is part of the Ministry of Science and Technology. Another major mechanism for funding of the local industry is government purchasing. Government purchasing represents 30% of the Brazilian pharmaceutical market. Brazil has not signed the WTO Government Procurement Agreement, but national law requires purchasing at the lowest cost, thereby effectively eliminating discrimination among foreign and domestic suppliers.

The Brazilian private capital market does not have sufficient scale to fund originator-type projects in the pharmaceutical sector. The government must step in to moderate risk.

US and other multinational Pharma companies have a capitalization 100 times greater than local Brazilian companies. Brazilian companies cannot afford to risk spending $100 million on development of a new originator product. The largest and most successful

private Brazilian pharmaceutical enterprise is Aché, which recently combined with another successful Brazilian enterprise, Biosintética. As discussed later at BNDES, this combination was supported financially by BNDES. The second and third largest private-sector companies are Sintefina and Cristália. None of these local Brazilian enterprises have sufficient capital to seek to create "new" products.

Eduardo Costa and Fiocruz are exploring the possibility of producing products under dependent-patent based compulsory licenses.

Denis Barbosa observed that Brazil made a tremendous pharmaceutical policy mistake when it implemented pharmaceutical product patent protection shortly after entry into force of the TRIPS Agreement, as compared with India which took advantage of a 10-year transition period. As a result, India maintains a significant API production industry with large economies of scale, while Brazil has seen its API production contract to supplying only 5% of the local market.

In response to my question how the Israeli enterprise TEVA had managed to become a world leader in the production and distribution of generic products despite Israel providing pharmaceutical product patent protection, he believes that Israel's technical and social policy base is more conducive to such success, but cannot entirely explain the phenomenon.

Brazilian local producers are suffering from a national law which mandates that procurement be awarded to the lowest-cost bidder. This works to the advantage of Indian and Chinese producers. This subject is covered at some length in following sessions with Eduardo Costa and Nicolau Lages.

15 years ago, a large percentage of the APIs used in Brazil were produced locally. Today, only 5% are produced locally. He attributes this to the changes in the patent law brought about by the TRIPS Agreement. $1 billion worth of APIs are imported into Brazil every year. Brazilian domestic products account for 30 to 35% of the local market.

1400 Brazilian pharmaceutical production lines were closed following 1994. In addition, he believes that US enterprises do not play fairly in the Brazilian market.

When the TRIPS-related changes were implemented into Brazilian patent law, very few judges had a good understanding of intellectual property law. Representations by foreign pharmaceutical manufacturers were rarely challenged and, if challenged, the position of the foreign manufacturer was typically upheld. Today, Abifina and others are supporting programs to educate judges and others in government about how patent systems should operate fairly.

Brazil has the fourth oldest patent law in the world. Since 1830, violating a patent has been a crime, but no one has ever gone to jail for violating a patent. Brazil has the second oldest constitutional provision protecting IP. Unlike the United States, Brazil was an original signatory of the Paris Convention for the Protection of Industrial Property.

Meeting of February 23, 2007 (10 a.m. – 2:30 pm)

Nicolau Pires Lages, Director Superintendent, Nortec Química, S.A., D. Caxias, Rio de Janeiro

Eduardo de Azeredo Costa, Director, Far-Manguinhos, FIOCRUZ, Rio de Janeiro

Nelson Brasil de Oliveira, 1st Vice President, Abifina

Nicolau Lages directs one of the few pharmaceutical API producers in Brazil. He observes that foreign companies will not sell their API technology to local Brazilian companies and that, in consequence, such technology is not used in Brazil.

Brazilian enterprises that manufacture APIs use them for their own products. They do not use patented technology, but may use off-patent technology.

Brazil has the scientific capacity to produce APIs. The technology is not the problem. It is the legal structure. As a general matter, the Brazilian chemical sector is successful.

One of the biggest difficulties facing local API producers is the national health regulatory requirement (ANVISA) that products sold on the Brazilian market be GMP (Good Manufacturing Practices) compliant. This is expensive and must generally be built in to production facilities in the design and construction phase. However, products imported from India and China may not be produced according to GMP standards. The government is now beginning to address that problem which has a substantial negative effect on the competitive position of the local producers of APIs. (The subject will be addressed further.)

There are three factors which account for the lack of competitiveness of the local API manufacturers:

a. They must comply with GMP standards. GMP compliance may account for 25% of production cost;
b. Labor costs are higher than for foreign competitors. If the direct cost of Brazilian labor is $100 per employee per day, when contributions to taxes and social security are included, the cost is 2.12 x as great.
c. The tax and tariff structure effectively discriminates against local producers. Until recently, value added tax (VAT) on pharmaceutical products amounted to 42% of price. This is now been reduced to 32-33%. On the other hand, the import duty or tariff on APIs is between 12 and 14%. Therefore, a Chinese or Indian exporter pays 12-14% to sell into the Brazilian market, while a Brazilian producer of APIs pays a 33% VAT. (Lia Hasenclever calculates this differential using a somewhat different

route – see discussion following – but agrees with the ultimate spread regarding payments.) Effectively, the government is discriminating in favor of foreign API producers and against the local industry.

Eduardo Costa provided a recent illustration in which Ely Lilly had won a government bid with a low price that initially included special exemption from the 14% import tax. On this occasion, the Ministry of Health and Fiocruz objected and the government ultimately rejected the foreign bid.

Lages noted that foreign producers are presently permitted to meet the ANVISA requirement of GMP compliance if their products satisfy the established product specifications. However, GMP compliance cannot be determined by examining the end product. It is a question of the production process which is determined by assessment of the production facility. Without such assessment, product safety may be compromised. ANVISA is a very strong regulatory agency with the power to reject and block products from the market.

According to Lages and Nelson Brasil, ANVISA is preparing to change its practice and initiate inspection of foreign production facilities, including in India and China.

Nelson Brasil indicated that this would be the most important development for the Brazilian local API industry. Because Brazilian producers must comply with GMP this would substantially level the playing field between foreign and domestic producers.

Nelson Brasil also indicated that China and India are paying export subsidies to their national API manufacturers. Brazil does not export pharmaceutical products to the United States because, at the present time, its industry is not price competitive

Eduardo Costa indicated that Far Manguinhos is now exporting (or preparing to export) ARVs to multilateral agencies, such as the Global Fund, based on requests from governments. It is helping to supply products in four African countries. Far Manguinhos can transfer technology, including acting as a partner with private commercial producers.

Far Manguinhos considers it important to achieve greater economies of scale. Its price for selling 70,000 units is going to be higher than its price for producing 700,000 units.

Costa is interested and ready to pursue discussions with the Colombian private or public sector. Far Manguinhos is prepared to supply APIs and formulation technology to Colombian enterprises, and does not need to export finished products.

Costa addressed the problem of competition with Chinese and Indian producers. Chinese and Indian producers typically sell, including to the Brazilian government, on short notice. Chinese and Indian products are often of low-quality, and are not infrequently rejected and returned by the Brazilian purchaser. This poses substantial difficulties for

Far Manguinhos in its production cycle. He proposes to alter the process for international tenders to address this problem.

Also, APIs are not a commodity. They need to be customized for individual formulations and equipment. Far Manguinhos frequently has difficulty using Chinese and Indian APIs in its formulation process; either the APIs do not fit properly in capsules or solidify too rapidly in the production process.

Far Manguinhos is seeking a mechanism for long-term purchasing in which the contract will be with the producer to provide supplies as requested. The contract will not be for specific stated volume of APIs, but for the right to purchase on request. Far Manguinhos will seek an arrangement which will permit it to specify the APIs and intermediaries needed for specific formulations, looking back into the production chain. He is hoping that Brazilian law can be interpreted (or modified) to permit this type of arrangement. This will allow Far Manguihos to customize its products and, in the end, will result in lower cost. One method of interpretation is to denominate the contract with the supplier substantially as a services contract.

It is not true that the lowest spot price bid for APIs results in the best longer-term solution for the Brazilian public health system. Improving the chain of production process will ultimately result in better and lower-cost products for the Brazilian public health system.

To achieve economies of scale, Brazilian API producers must also export.

Last February (2006) Far Manguinhos was visited by some persons from Colombia. As far as Costa is aware, there was no follow-up to that visit.

Argentina and Brazil have initiated a new binational pharmaceutical consultative process, which involves the private sector on the Argentina side.

The multinational pharmaceutical companies are attempting to deter Brazil from developing its local API production capacity.

To reiterate, Far Manguinhos would be able to offer a variety of arrangements to Colombian enterprises, including possibilities for distribution of finished products and provision of APIs, other components and formulation technology.

Meeting of February 26, 2007 (11 a.m. – 2 p.m.)

Jorge de Paula Costa Avila, President, INPI (National Institute for Industrial Property), Rio de Janeiro

Jorge Avila indicated that the TRIPS Agreement changed the way that Brazil thinks about intellectual property, including the possibilities for development. In the 1990s, Brazilian industrial policy focused on improving the quality of manufacturing which

substantially improved performance in the export sector, and has dramatically improved the trade balance. That model is now exhausted since manufacturing quality is high.

The new Industrial and Foreign Trade Policy focuses on promotion of innovation.

Intellectual property was formerly seen as a cost. Now intellectual property (IP) is seen as a tool, but the tool needs to be "adequately calibrated". There should not be unnecessary costs.

IP is not an end in itself, or a natural right. It needs to be calibrated. What is it?

a. It is a set of things that involve the extension of rights, but what should be patented?
b. For example, should "Markush" patenting be permitted? One patent protects millions of substances, but what has been invented? Your patent cannot impose costs on other millions of uses of the molecule. This creates a lot of questions for the public health system, including regarding second use patents.
c. INPI has been developing less extensive rights. There should be no patenting of a second use if that use was disclosed or implicit in the first use -- as with Viagra.
d. Everybody must be allowed to undertake research under Markush patents. What they specifically find should be protected.

Discussions in Brazil have become very sophisticated:

1. More basic research is needed on pharmaceuticals, new drugs, especially for policy areas such as new treatments for tropical diseases. Public health system purchasing power can help in the early stages of development, possibly leading to cooperation among major actors, including for national financing and the export market.
2. More complex, possibly to have medium-sized generic producers and links between the smaller and bigger groups, possibly partnerships, involving the distribution capacity of the medium-size companies. Possibly even have transfer of technology in Brazil through voluntary licensing to these companies, though so far that has clearly not happened.
3. The tradition of no patents, synthesizing without the help of the originators and only for the internal market without exports, the local industry did not develop a way of communicating with the multinationals, but perhaps this would not have changed things in Brazil.
4. He does not believe that industry as a whole can be developed through compulsory licensing of patents, though there may be specific parts of the public health sector for which this is appropriate. Compulsory licensing is not a tool for industrial development. You cannot base an industrial policy on compulsory licensing.

5. Regional policy is very important. Brazil is promoting a meeting of Latin American IP authorities to build a system of mutual cooperation.
6. Brazil must take into account global realities and the perception of the need for protecting IP.

Avila is definitively interested in promoting Brazilian-Colombian cooperation.

Brazil has received 22,000 pharmaceutical patent applications since the TRIPS Agreement. Almost all are foreign. INPI has 80 patent examiners solely devoted to the pharmaceutical sector. 6000 applications are being processed in 2007. Patent applications pay for INPI's work, and generate a surplus.

Meeting of February 26, 2007 (2:30 p.m. – 4:30 p.m.)

Pedro Lins Palmeira Filho, Head of Department, Intermediate Products and Pharmaceuticals, BNDES (Banco Nacional de Desenvolvimento Econômico e Social), Rio de Janeiro

Luciana Xavier de Lemos Capanema, Manager, Intermediate Products and Pharmaceuticals, BNDES, Rio de Janeiro

Luise Angela Cunha Velloso, Manager, Intermediate Products and Pharmaceuticals, BNDES, Rio de Janeiro

Pedro Palmeira made a detailed presentation of the activities of BNDES in the pharmaceutical sector. A brief PowerPoint presentation was included, and is attached as an annex to this report. The oral presentation was substantially more detailed. It is notable, in addition, that Luciana Xavier de Lemos Capanema has recently prepared a detailed study of the Brazilian pharmaceutical industry and the activities of BNDES which was published and provided to the author of this report. A copy is attached as an annex to this report (in Portuguese).

BNDES did not address the pharmaceutical sector as a priority from the 1980s through 2003, at which time Brazil launched a new industrial policy initiative which supports local development and production of pharmaceuticals. This is one of four major sectors addressed in the new policy, which includes also semiconductors, manufacturing equipment and software.

Brazilian enterprises face competitive disadvantages in comparison to Indian and Chinese pharmaceutical producers. Brazil is down to almost 0% local production of APIs. The challenge is to reverse this situation.

After discussion with relevant local groups, in April 2004 BNDES launched a financing program for the pharmaceutical sector with conditions differentiated from other sectors.

The main element is PROFARMA which is a support program for the pharmaceutical supply chain with certain subprograms.

The first program is oriented toward production capacity, including financing for achieving GMP and US FDA compliance. BNDES provides loans (not grants) for which there is no maximum limit (theoretically BNDES may also provide guarantees to private banks, but has not done this for this sector). The objective is to strengthen the international competitive position of the Brazilian producers.

The second element is to provide financing and support for mergers and acquisitions among local companies in order to create larger and more internationally competitive enterprises in this sector. 1 ½ years ago, the enterprise Aché acquired Biosintética with assistance of this program. The net result is an enterprise with annual revenues of approximately 750 million US dollars. BNDES is presently attempting to induce further combinations in this sector.

Almost all Brazilian pharmaceutical enterprises are family-owned businesses and appear to be satisfied with their results on the local market. There are no publicly traded Brazilian pharmaceutical companies.

The third element concerns research, development and innovation (R, D &I). In this regard, BNDES provides both loans and equity investment. Loan terms and interest rates are comparable with the private sector.

Because Brazilian enterprises do not have sufficient capital to invest in research on new originator products, most research is done on "me too" or incremental innovation, including second uses of known products. A cooperative program known as "COINFAR", an initiative of BIOLAB-SANUS with BIOSINTETICA and UNIAO QUÌMICA is promoting more "radical" innovation (involving substances derived from snake poisons), which has so far resulted in the filing of five or six patent applications at the USPTO.

Lending for innovation may range from R$1 to 500 million (i.e., up to US$250 million), ranging from a new laboratory to a complete production facility.

BNDES does not intend to retain equity investment. Shares should be sold to the public in three to five years. BNDES may initially purchase an equity investment up to 40%.

BNDES sees the need to streamline the process so as to allow medium-size and start-up companies to participate.

There is limited venture capital investment in Brazil in pharmaceutical R&D.

PROFARMA has so far financed 32 transactions with respect to production (R$ 446,000,000), 1 transaction with respect to strengthening of enterprises (R$ 295,000,000) and 10 transactions for R, D & I (R$ 115,295,000). This amounts to approximately R$ 1

billion, or US$ 500 million, in a period of about two years. 80% of the investment is in Brazilian capitalized companies.

In Brazil 40% of the local market is supplied by local producers and 60% is supplied by foreign producers. Far Manguinhos has strong research and development capacity. The country will concentrate on improvement of API capacity.

In order to participate in BNDES funding programs a producer must be GMP compliant.

Meeting of February 27, 2007 (2 – 6 p.m.)

Adelaide Maria de Souza Antunes, Prof., Technological Innovation and Management, Coordinator of the Information System of Chemical Industry, SIQUIM, School of Chemistry, Federal University of Rio de Janeiro

Adelaide Antunes indicates she is responsible for courses at the Federal University with respect to all sectors of chemistry. A major aspect of her work concerns the use of patents as an information source, and she is collaborating with INPI (Jorge Avila, see above) to improve the utility of the national database. She views this as a five-year enterprise. She presently prefers the DERWENT commercial database as an information source because it lets you identify specific fields and trends. She has conducted searches for government and industry, and has produced reports for the national industrial strategy center (CGSC), including with respect to the petroleum sector and agriculture. She is now preparing a study for the electronics industry. She notes that young people are particularly good with the Internet and identifying useful sources of data.

With respect to the pharmaceutical sector, she has traced the pharmaceutical supply chain up from raw materials, including the routes of importation, to attempt to determine potential opportunities for Brazilian industry. She has created a database with respect to intermediate products, i.e., what patents exist at what stage of production. She is particularly looked at data on tuberculosis research.

She strongly recommends attending the CPhI annual conference at which the latest pharmaceutical production products and technology services are exhibited. She emphasizes that not only equipment, but also production process technology is available for purchase on world markets. (This is a point which the author of this report consistently makes when discussing transfer of technology. It is not necessary to build a university to acquire important technologies. There is a market for this.)

Also at her university she has equipment (reactors) which allows her to test experimental ideas generated by university and small business enterprises for commercial viability.

She believes that few people in Brazil take a “holistic” view of the pharmaceutical sector in the sense of attempting to combine all of the elements.

Brazil has now created many opportunities. She discussed the programs of BNDES (see above) and a Sectoral Fund established by the Ministry of Science and Technology. There are 21 sectors, including health and biotechnology. (See http://www.mct.gov.br/index.php/content/view/725.html) A call was issued for universities and industry to submit proposals, but there was limited take-up.

The pharmaceutical industry has been run by the same group for more than 30 years in Brazil, it is not a growing field.

From the university side there has been great improvement in using research funds for development in the field of medicine and pharmaceuticals, as well as other fields. But, the connection between university and industry is still weak.

Francisco [], a Colombian working with UNDP asked her to do a patent study with respect to HIV-AIDS medicines.

Look at MCT (Ministerio Ciencia e Tecnologia) (<http://www.mct.gov.br/>) link to Portal da Inovação (<http://portalinovacao.mct.gov.br/ISPublish/inovacao/portal/>).

Up until 10 years ago, researchers in the academic community did not like to cooperate with industry.

Today there are a few people in Brazil with deep knowledge of chemical synthesis. Industry requires that production can take place on large-scale. There is a gap in transferring university research to industry. There is little money to construct university laboratories that replicate commercial conditions. Good Brazilian scientists emigrate because there is little opportunity in Brazil.

In her view, there needs to be industrial demand for the products of the technology incubators. Yet government and industry say there is little money available for the product incubators.

Her medical practitioner colleague suggested that eight medicines are used to solve about 80% of Brazil's typical health care needs, and that about 90% of Brazil's needs are not protected by patent.

Programs are needed for diseases other than AIDS, which gets most of the attention. Local producers do not believe in the government programs. The problem of competing with cheap Chinese APIs is not discussed.

A Brazilian company named Microbiologica attempted to manufacture AZT in Brazil, but because of patent difficulties could only export to Argentina. The company closed its production facility and sells technological expertise to the United States.

There is also a lack of the study of management of the pharmaceutical industry. A holistic view is needed. She has started a Ph.D. program in the management of

technology and innovation. 100 theses have been completed. (She showed me a listing on her web site.)

She referred to the Millennium Institute regarding forecasting for the management of information – how to move innovation closer to the market.

Brazil has seen the closure of a very large number of pharmaceutical and fine chemical production lines. Hoechst (Germany) closed its plant in São Paulo, among the many foreign companies that closed operations of APIs and formulation of medicines in Brazil following the opening of market in late 1980s. After these closures prices initially declined, but have now skyrocketed.

Prices in Brazil vary depending upon the link with multinationals. Most pricing in Brazil is parent-subsidiary pricing.

She agrees that implementation of the TRIPS agreement was terrible for the Brazilian pharmaceutical and chemical industry, but also says the government could have taken more steps to protect the industry. The government effectively supported the industries from the developed countries.

58 universities from around the world are now collaborating in research, though it is very difficult to coordinate.

There is too much "general information" being generated, but not enough is done to transfer that information effectively to industry.

Today in Brazil, university professors can enter into arrangement with private companies through foundations. 15 years ago this was not accepted, but it is today.

Considerable work is now being done by Centro de Biotecnologia da Amazonia (CBA), a governmental research institute created to investigate the industrial uses of Amazon forest biodiversity). It is investigating and pursuing opportunities in cosmetics, as well as pharmaceuticals, beverages, etc., derived from plants. CBA has constructed a manufacturing facility in the Amazon, although it is difficult to attract workers.

Adelaide Antunes indicated that she visited a research institute concerned with tuberculosis in Colombia last year. She is very happy to consider collaboration with the Colombian public and private sector. I suggested, in particular, that she meet with Alix Cespedes of the Colombian Patent Office because they share backgrounds in chemical engineering and both have interest in patenting of chemical technology.

d. Academic, Policy and Research Collaboration

Meeting of February 22, 2007 (11 a.m. – 2 p.m.)

Prof. Dr. Claudia Inẽs Chamas, FIOCRUZ, Oswaldo Cruz Foundation and Institute, Ministry of Health, Rio de Janeiro

Márcia Maria Nunes de Barros, Federal Judge, Intellectual Property Division, Rio de Janeiro

João Marcelo de Lima Assafim, Attorney (Intellectual Property and Antitrust) and Lecturer at Universidade Candido Mendes, Fed. Univ. Rio de Janeiro (MINDS faculty), Rio de Janeiro

José Carlos Vaz e Dias, Attorney, Intellectual Property, and MINDS Faculty, Rio de Janeiro

Claudia Chamas reported that Ford Foundation is funding the MINDSprogram to study how IP policy is changing in Brazil, to foster development of IP in Brazil, but not using the US or EU model. Instead, to cooperate with innovative developing countries like India, China and South Africa which also have social problems. Richard Nelson at Columbia University is directing the MINDS Project for the Ford Foundation. They are currently doing a comparative study of US and Indian IP policy, including assessment of patent office practices.

Claudia Chamas prepared a detailed report on Developing Innovative Capacity in Brazil to Meet Health Needs for the WHO Commission on Intellectual Property Rights, Innovation and Public Health. That report is attached as an annex. Other parts of the same study include discussion of several other countries (i.e., China, India and South Africa).

Claudia Chamas has also supplied a very useful general paper on transfer of technology in Latin American, which is also attached as an annex.

With respect to cooperation with Colombia, there is of course the problem of the language barrier. Also, there is also the question of how much money each country contributes to technology development. Brazil invests a considerable amount in promotion of innovation. There is no real cooperation between researchers in Latin America.

MINDS is interested in South-South cooperation. Regulatory frameworks are not very well built. In Brazil, since 2004 the Innovation Law was introduced and is designed to foster cooperation between researchers and industry, comparable (but not the same as) the Bayh-Dole Act in the United States. An English language version is attached as an annex. This appears to be showing some results.

Argentina and Chile do not have similar legislation, and other countries in Latin America are deficient in this area.

MINDS is attempting to promote a safe environment for innovation in Brazil.

Brazil is much interested in research on neglected diseases. The Oswaldo Cruz Foundation is doing work in this area, including under the direction of Carlos Morel, formerly at WHO TDR. Their first development center will be ready at the end of 2008, and includes international cooperation. She believes there may be some discussion with research centers in Colombia.

Márcia Maria Nunes de Barros indicated that the Brazilian federal court system has now designated certain courts to handle intellectual property cases, and she is a judge on one of those courts. The same courts also handle social security matters and have very heavy dockets. Nonetheless, this is certainly an improvement over the previous situation in terms of the capability of judges to understand and decide IP cases.

Meeting of February 27, 2007 (10 a.m. – 12 p.m.)

João Luiz Maurity Saboia, Director, Institute of Economics, Federal University of Rio de Janeiro

Lia Hasenclever, Prof., Economics of Innovation Group, Institute of Economics, Federal University of Rio de Janeiro

Ana Célia Castro, Planning Coordinator, Center for Law and Economics, Federal University of Rio de Janeiro

Lia Hasenclever suggested that I speak with a representative of Genvida, a local company which attempted to produce ARV APIs but was not successful. MAPPEL (owned by Marion Appel) today concentrates on providing formulation production technologies after exiting the API business.

Public Tender Law 8.666 is harmful to the local pharmaceutical industry because it mandates that the government must purchase from the lowest cost bidder. She notes the plan by Costa to contract for services.

ANVISA requires GMP compliance for final products, but not yet for APIs. The plan is to extend the compliance requirement.

She indicated that the 12% duty referred to by Lages is called PIS COFINS. There is a 19% VAT (ICMS) assessed within Río de Janeiro, and the VAT is variable depending upon what the Brazilian state the producer is located in. Federal law, however, generally exempts Chinese and Indian producers from the 12% PIS COFINS.

Local Brazilian producers do not trade on the public securities markets because regulatory oversight of private family companies is very lax. There are no disclosure or public accountability requirements. Since 1977, a new law regarding S.A.'s increased accountability requirements, particularly for companies with over 200 employees. This apparently does not traditionally apply to family-owned pharmaceutical companies.

João Luiz Maurity Saboia, Director of the Institute, indicated that he would be happy to consider proposals for cooperation with Colombian counterparts.

5. Resources and Potential Avenues of Collaboration

There are several important resources identified for Colombia.

At the most pragmatic level, follow up with Eduardo Costa, Director of Far Manguinhos on potential licensing and enterprise collaboration is in line with improving technology transfer into Colombia. Cooperation with public and private sector enterprises may be considered.

Adelaide Antunes appears to be an extremely valuable resource person whose work is compatible with the potential needs of Colombian pharmaceutical producers for non-patented technology which nonetheless may have substantial commercial value. In addition, she is running a top flight research program in the pharmaceutical sector.

Jorge Avila, President of INPI, expressed interest in cooperation with the Colombian patent office.

There is also potential for cooperation with Nortec (Nicolau Lages) and other private API producers in Brazil.

The visit identified two possibilities for academic research/policy collaboration: with Claudia Chamas, Oswaldo Cruz and the MINDS Project, and; Lia Havenclever, Ana Célia Castro and João Luiz Maurity Saboia, all at the Federal University of Rio de Janeiro.

6. Follow-Up Comparative Assessment and Policy Recommendations

A few important themes emerged from discussion in Brazil:

a) There is a strong sense that regional cooperation and integration in Latin American production, distribution, regulation and research will be helpful to improving the competitive structure of the Latin American pharmaceutical sector. However, all discussants are aware that there is a long history of Latin American integration efforts which have encountered significant obstacles. Therefore, the difficulties of achieving successful results should not be underestimated.

b) Government policies and regulation have a strong impact on the development of the commercial pharmaceutical sector. This is emphasized by Brazilian API producers, government officials and academics. There are unique characteristics to fostering innovation in the pharmaceutical sector – such as a combination of high expense and high risk – which make commercial success difficult. Government, industry and academics may take steps to identify technologies that are not covered by patents or other forms of marketing exclusivity in order to

provide avenues for the domestic pharmaceutical industry to achieve success with a lower level of risk and expense.

c) As also emphasized in a recent report by the US Government Accountability Office (GAO, New Drug Development, Nov. 2006, GAO-07-49), establishing successful links between academic research institutions and the commercial pharmaceutical sector is substantially more difficult than may typically be given credit. This is a recurring theme among Brazilians at all levels of involvement in the pharmaceutical sector.