

accepted definition of what constitutes a stillbirth, and there are no universally recommended, standardized stillbirth evaluation protocols in use for the evaluation of fetal deaths. The proposed survey has been designed to evaluate and assess the knowledge, attitudes and practice management patterns of obstetricians in the metropolitan Atlanta area regarding stillbirths in general, as well as in their medical practice. This

information will be used to identify prevailing deficiencies leading to incomplete and inaccurate reporting of data relative to stillbirths, and to develop targeted awareness and educational strategies for participating MACDP facilities. Ongoing, accurate and reliable population-based registries of stillbirths are essential for conducting epidemiologic studies on the causes of and risk factors for this pregnancy

outcome. This survey will be mailed to randomly selected obstetricians whose practices serve residents of the 5 counties comprising metropolitan Atlanta. This survey will be conducted once and will take approximately 2–3 months to collect the data. NCBDDD is requesting OMB clearance for 1 (one) year. There is no cost to the survey respondents except for the time necessary to complete the survey.

#### ESTIMATED ANNUALIZED BURDEN TABLE

Respondents (type)	Respondents (number)	Number of responses per respondent	Average burden per response (in hrs.)	Total burden (in hrs.)
Obstetricians .....	600	1	30/60	300
Total .....	600	.....	.....	300

Dated: December 7, 2005.

Joan F. Karr,

Acting Reports Clearance Officer, Centers for Disease Control and Prevention.

[FR Doc. E5-7260 Filed 12-12-05; 8:45 am]

BILLING CODE 4163-18-P

## DEPARTMENT OF HEALTH AND HUMAN SERVICES

### Food and Drug Administration

[Docket No. 2005N-0479]

#### International Drug Scheduling; Convention on Psychotropic Substances; Single Convention on Narcotic Drugs; Butorphanol; Delta-9-tetrahydrocannabinol (Dronabinol); Gamma-Hydroxybutyric Acid; Ketamine; Khat; Tramadol; Zopiclone; Buprenorphine; Oripavine

**AGENCY:** Food and Drug Administration, HHS.

**ACTION:** Notice.

**SUMMARY:** The Food and Drug Administration (FDA) is requesting interested persons to submit comments concerning abuse potential, actual abuse, medical usefulness, trafficking, and impact of scheduling changes on availability for medical use of nine drug substances. These comments will be considered in preparing a response from the United States to the World Health Organization (WHO) regarding the abuse liability and diversion of these drugs. WHO will use this information to consider whether to recommend that certain international restrictions be placed on these drugs. This notice requesting comments is required by the Controlled Substances Act (CSA).

**DATES:** Submit written or electronic comments by January 12, 2006.

**ADDRESSES:** Submit written comments to the Division of Dockets Management (HFA-305), Food and Drug Administration, 5630 Fishers Lane, rm. 1061, Rockville, MD 20852. Submit electronic comments to <http://www.fda.gov/dockets/ecomments>.

**FOR FURTHER INFORMATION CONTACT:** James R. Hunter, Center for Drug Evaluation and Research (HFD-9), Food and Drug Administration, 5600 Fishers Lane, Rockville, MD 20857, 301-443-5563, e mail: [hunterj@cder.FDA.gov](mailto:hunterj@cder.FDA.gov).

**SUPPLEMENTARY INFORMATION:** The United States is a party to the 1971 Convention on Psychotropic Substances. Article 2 of the Convention on Psychotropic Substances provides that if a party to the convention or WHO has information about a substance, which in its opinion may require international control or change in such control, it shall so notify the Secretary General of the United Nations and provide the Secretary General of the United Nations with information in support of its opinion.

The CSA (21 U.S.C. 811 *et seq.*) (Title II of the Comprehensive Drug Abuse Prevention and Control Act of 1970) provides that when WHO notifies the United States under Article 2 of the Convention on Psychotropic Substances that it has information that may justify adding a drug or other substances to one of the schedules of the convention, transferring a drug or substance from one schedule to another, or deleting it from the schedules, the Secretary of State must transmit the notice to the Secretary of the Department of Health and Human Services (the Secretary of HHS). The Secretary of HHS must then publish the notice in the **Federal Register** and provide opportunity for interested persons to submit comments that will be considered by HHS in its

preparation of the scientific and medical evaluations of the drug or substance.

#### I. WHO Notification

The Secretary of HHS received the following notices from WHO:  
Ref: C.L.29.2005

#### WHO Questionnaire for Collection of Information for Review of Dependence-Producing Psychoactive Substances

The WHO presents its compliments and has the pleasure of informing Member States and Associate Members that the Thirty-fourth Expert Committee on Drug Dependence will meet from March 28 to 31, 2006 to review the following substances:

1. Butorphanol (INN)
2. Dronabinol (INN)<sup>1</sup>
3. Gamma-hydroxybutyric acid
4. Ketamine (INN)
5. Khat (*Catha edulis* Forsk)
6. Tramadol (INN)
7. Zopiclone (INN)

As a follow-up for the thirty-third meeting of the Expert Committee on Drug Dependence, final decisions will be taken for buprenorphine (INN) and oripavine (INN).

One of the essential elements of the established review procedure is for the Secretariat to collect relevant information from Member States to prepare a Critical Review Report for submission to the Expert Committee on Drug Dependence. WHO invites Member States to collaborate, as in the past, in this process by providing pertinent information mentioned in the attached questionnaire concerning substances listed above.

Further clarification on any of the above items can be obtained from Quality Assurance and Safety: Medicines, Department of Medicines Policy and Standards, WHO, Geneva, to which replies should be sent not later than January 3, 2006.

WHO takes this opportunity to renew to Member States and Associate Members the assurance of its highest consideration.

GENEVA, October 27, 2005

\* \* \* \* \*

<sup>1</sup>Including its stereo-isomers.

If statistical information requested is not readily available, a brief descriptive answer would be appreciated.

Please attach copies of relevant study reports and other background information as appropriate.

\* \* \* \* \*

**1. BUTORPHANOL (INN)**  
1. LEGITIMATE USE OF THE SUBSTANCE

1.1 Is the substance currently registered as a medical product? (Yes/No)  
If "yes," since when (year of marketing)?  
19\_\_\_\_  
Please indicate trade name(s), dosage form(s) with strength(s) and indication(s):

Trade Name	Dosage Form	Strength(s)	Indication(s)

1.2 If the answer to 1.1 is "no," is there other legitimate use of the substance? (Yes/No)  
If "yes," please describe the purpose of use.

1.3 If there is legitimate use of the substance, how is the substance supplied? (Imported/Manufactured in the country)  
**2. ABUSE OF THE SUBSTANCE**  
2.1 Is the substance abused or misused<sup>2</sup> in your country? (Yes/No/No Information)  
2.2 If "yes," any information on the extent of abuse?

2.3 Any information on the extent of public health or social problems associated with the abuse of the substance (statistics on cases of overdose deaths, dependence, etc.)?  
**3. ILLICIT ACTIVITIES INVOLVING THE SUBSTANCE**  
3.1 Any information on the nature and extent of illicit activities involving the substance (clandestine manufacture, smuggling, diversion, seizure, etc.)?  
**4. IMPACT OF SCHEDULING**  
4.1 If butorphanol is placed under international control, do you think that its

availability for medical use will be affected? (Yes/No)  
4.2 If "yes," how do you think the transfer will impact its medical availability?  
**2. DRONABINOL (INN) AND ITS STEREO-ISOMERS**  
1. LEGITIMATE USE OF THE SUBSTANCE  
1.1 Is the substance currently registered as a medical product? (Yes/No)  
If "yes," since when (year of marketing)?  
19\_\_\_\_  
Please indicate trade name(s), dosage form(s) with strength(s) and indication(s):

Trade Name	Dosage Form	Strength(s)	Indication(s)

1.2 If the answer to 1.1 is "no," is there other legitimate use of the substance? (Yes/No)  
If "yes," please describe the purpose of use.

1.3 If there is legitimate use of the substance, how is the substance supplied? (Imported/Manufactured in the country)  
**2. ABUSE OF THE SUBSTANCE**  
2.1 Is the substance abused or misused in your country? (Yes/No/No information)

2.2 If "yes," any information on the extent of abuse?  
2.3 Any information on the extent of public health or social problems associated with the abuse of the substance (statistics on cases of overdose deaths, dependence, etc.)?  
**3. ILLICIT ACTIVITIES INVOLVING THE SUBSTANCE**  
3.1 Any information on the nature and extent of illicit activities involving the substance (clandestine manufacture, smuggling, diversion, seizure, etc.)?

**3. GAMMA-HYDROXYBUTYRIC ACID (GHB)**  
1. LEGITIMATE USE OF THE SUBSTANCE  
1.1 Is the substance currently registered as a medical product? (Yes/No)  
If "yes," since when (year of marketing)?  
19\_\_\_\_  
Please indicate trade name(s), dosage form(s) with strength(s) and indication(s):

Trade Name	Dosage Form	Strength(s)	Indication(s)

1.2 If the answer to 1.1 is "no," is there other legitimate use of the substance? (Yes/No)  
If "yes," please describe the purpose of use.

1.3 If there is legitimate use of the substance, how is the substance supplied? (Imported/Manufactured in the country)  
**2. ABUSE OF THE SUBSTANCE**  
2.1 Is the substance abused or misused in your country? (Yes/No/No information)

2.2 If "yes," any information on the extent of abuse?  
2.3 Any information on the extent of public health or social problems associated with the abuse of the substance (statistics on cases of overdose deaths, dependence, etc.)?  
**3. ILLICIT ACTIVITIES INVOLVING THE SUBSTANCE**  
3.1 Any information on the nature and extent of illicit activities involving the substance (clandestine manufacture, smuggling, diversion, seizure, etc.)?

**4. IMPACT OF TRANSFER TO SCHEDULE II or III OF THE CONVENTION ON PSYCHOTROPIC SUBSTANCES, 1971, ON MEDICAL AVAILABILITY**  
4.1 If gamma-hydroxybutyric acid is transferred from Schedule IV of the Convention on Psychotropic Substances, 1971, to either Schedule II or III of the Convention on Psychotropic Substances, do you think that its availability for medical use will be affected? (Yes/No)  
4.2 If "yes," how do you think the transfer will impact its medical availability?

<sup>2</sup>In this questionnaire, "abuse or misuse" refers to use of the substance other than for medical or scientific purposes.

**4. KETAMINE (INN)**

1. LEGITIMATE USE OF THE SUBSTANCE

1.1 Is the substance currently registered as a medical product? (Yes/No)  
 If "yes," since when (year of marketing)?  
 19 \_\_\_\_\_

Please indicate trade name(s), dosage form(s) with strength(s) and indication(s):

Trade Name	Dosage Form	Strength(s)	Indication(s)

1.2 If the answer to 1.1 is "no," is there other legitimate use of the substance? (Yes/No)

If "yes," please describe the purpose of use.

1.3 If there is legitimate use of the substance, how is the substance supplied? (Imported/Manufactured in the country)

2. ABUSE OF THE SUBSTANCE

2.1 Is the substance abused or misused in your country? (Yes/No/No information)

2.2 If "yes," any information on the extent of abuse?

2.3 Any information on the extent of public health or social problems associated with the abuse of the substance (statistics on cases of overdose deaths, dependence, etc.)?

3. ILLICIT ACTIVITIES INVOLVING THE SUBSTANCE

3.1 Any information on the nature and extent of illicit activities involving the substance (clandestine manufacture, smuggling, diversion, seizure, etc.)?

4. IMPACT OF SCHEDULING

4.1 If ketamine is placed under international control, do you think that its

availability for medical use will be affected? (Yes/No)

4.2 If "yes," how do you think the transfer will impact its medical availability?

**5. KHAT (CATHA EDULIS Forsk.)**

1. LEGITIMATE USE OF THE SUBSTANCE

1.1 Is the substance currently registered as a medical product? (Yes/No)

If "yes," since when (year of marketing)?  
 19 \_\_\_\_\_

Please indicate trade name(s), dosage form(s) with strength(s) and indication(s):

Trade Name	Dosage Form	Strength(s)	Indication(s)

1.2 If the answer to 1.1 is "no," is there other legitimate use of the substance? (Yes/No)

If "yes," please describe the purpose of use.

1.3 If there is legitimate use of the substance, how is the substance supplied? (Imported/Manufactured in the country)

2. ABUSE OF THE SUBSTANCE

2.1 Is the substance abused or misused in your country? (Yes/No/No information)

2.2 If "yes," any information on the extent of abuse?

2.3 Any information on the extent of public health or social problems associated with the abuse of the substance (statistics on cases of overdose deaths, dependence, etc.)?

3. ILLICIT ACTIVITIES INVOLVING THE SUBSTANCE

3.1 Any information on the nature and extent of illicit activities involving the substance (clandestine manufacture, smuggling, diversion, seizure, etc.)?

4. IMPACT OF SCHEDULING

4.1 If khat is placed under international control, do you think that its availability for medical use will be affected? (Yes/No)

4.2 If "yes," how do you think the transfer will impact its medical availability?

**6. TRAMADOL (INN)**

1. LEGITIMATE USE OF THE SUBSTANCE

1.1 Is the substance currently registered as a medical product? (Yes/No)

If "yes," since when (year of marketing)?  
 19 \_\_\_\_\_

Please indicate trade name(s), dosage form(s) with strength(s) and indication(s):

Trade Name	Dosage Form	Strength(s)	Indication(s)

1.2 If the answer to 1.1 is "no," is there other legitimate use of the substance? (Yes/No)

If "yes," please describe the purpose of use.

1.3 If there is legitimate use of the substance, how is the substance supplied? (Imported/Manufactured in the country)

2. ABUSE OF THE SUBSTANCE

2.1 Is the substance abused or misused in your country? (Yes/No/No information)

2.2 If "yes," any information on the extent of abuse?

2.3 Any information on the extent of public health or social problems associated with the abuse of the substance (statistics on cases of overdose deaths, dependence, etc.)?

3. ILLICIT ACTIVITIES INVOLVING THE SUBSTANCE

3.1 Any information on the nature and extent of illicit activities involving the substance (clandestine manufacture, smuggling, diversion, seizure, etc.)?

4. IMPACT OF SCHEDULING

4.1 If tramadol is placed under international control, do you think that its

availability for medical use will be affected? (Yes/No)

4.2 If "yes," how do you think the transfer will impact its medical availability?

**7. ZOPICLONE (INN)**

1. LEGITIMATE USE OF THE SUBSTANCE

1.1 Is the substance currently registered as a medical product? (Yes/No)

If "yes," since when (year of marketing)?  
 19 \_\_\_\_\_

Please indicate trade name(s), dosage form(s) with strength(s) and indication(s):

Trade Name	Dosage Form	Strength(s)	Indication(s)

Trade Name	Dosage Form	Strength(s)	Indication(s)

1.2 If the answer to 1.1 is "no," is there other legitimate use of the substance? (Yes/No)

If "yes," please describe the purpose of use.

1.3 If there is legitimate use of the substance, how is the substance supplied? (Imported/Manufactured in the country)

## 2. ABUSE OF THE SUBSTANCE

2.1 Is the substance abused or misused in your country? (Yes/No/No information)

2.2 If "yes," any information on the extent of abuse?

2.3 Any information on the extent of public health or social problems associated with the abuse of the substance (statistics on cases of overdose deaths, dependence, etc.)?

## 3. ILLICIT ACTIVITIES INVOLVING THE SUBSTANCE

3.1 Any information on the nature and extent of illicit activities involving the substance (clandestine manufacture, smuggling, diversion, seizure, etc.)?

## 4. IMPACT OF SCHEDULING

4.1 If zopiclone is placed under international control, do you think that its availability for medical use will be affected? (Yes/No)

4.2 If "yes," how do you think the transfer will impact its medical availability?

## 8. BUPRENORPHINE (INN)

### 1. IMPACT OF TRANSFER TO SCHEDULE I OF THE SINGLE CONVENTION ON NARCOTIC DRUGS, 1961, ON MEDICAL AVAILABILITY

1.1 If buprenorphine is transferred from Schedule III of the Convention on Psychotropic Substances, 1971, to Schedule I of the Single Convention on Narcotic Drugs, 1961, do you think that its availability for medical use will be affected? (Yes/No)

1.2 If "yes," how do you think the transfer will impact its medical availability?

## II. Background

Butorphanol is classified as a synthetic opiate partial agonist analgesic. It is marketed in the United States for the management of pain as an injectable and as a nasal spray solution. It is controlled domestically in Schedule IV of the CSA and is not controlled internationally under the Psychotropic Convention or the Single Convention on Narcotic Drugs.

Synthetic *delta*-9-tetrahydrocannabinol (*delta*-9-THC), or dronabinol, is the active component of the drug product Marinol, which is marketed in the United States as an antiemetic in the setting of cancer chemotherapy and for treatment of AIDS wasting syndrome. Marinol is currently

controlled in Schedule III of the CSA, and the drug substance dronabinol (which is the synthetic equivalent of the natural active component of marijuana, *delta*-9-THC) is controlled in Schedule I of the CSA. The drug substance dronabinol, including its isomers, is controlled internationally in Schedule II of the Psychotropic Convention.

Gamma-hydroxybutyric acid (GHB) is classified as a central nervous system depressant. In 2002, FDA approved a GHB-containing product, Xyrem, for the treatment of cataplexy associated with narcolepsy. Xyrem was approved under the regulations in 21 CFR part 314, subpart H (21 CFR 314.520), and the product labeling contained a comprehensive risk management program, which includes restricted distribution of the drug through a central pharmacy. Xyrem is controlled domestically in Schedule III of the CSA, while bulk GHB and all other material containing GHB is controlled in Schedule I. In addition, illicit use of Xyrem is subject to Schedule I penalties of the CSA. GHB is controlled internationally in Schedule IV of the Psychotropic Convention.

Ketamine is classified as a rapid-acting general anesthetic agent used for short diagnostic and surgical procedures that do not require skeletal muscle relaxation. It is marketed in the United States as an injectable. Ketamine is controlled domestically in Schedule III of the CSA. It is not controlled internationally under the Psychotropic Convention or the Single Convention on Narcotic Drugs.

Khat (or qat) refers to the leaves and young shoots of the plant *Cathia edulis* Forsk. The principal psychoactive substances contained in khat leaves are cathinone and cathine. Cathinone ( $\alpha$ -ketoamphetamine) is a monoamine alkaloid that is controlled domestically and internationally in Schedule I. The DEA published a final rule on January 14, 1993 (58 FR 4316), that results in the placement of any material that contains cathinone into Schedule I, which includes khat. Cathine, also a monoamine alkaloid, is controlled domestically in Schedule IV of the CSA and internationally in Schedule III drug under the Convention on Psychotropic Substances. In 1980, WHO classified khat as a drug of abuse that can produce mild to moderate psychic dependence, however khat is not controlled

internationally under the Psychotropic Convention or the Single Convention on Narcotic Drugs.

Tramadol is a centrally acting synthetic analgesic. At least two complementary mechanisms of action appear applicable: binding of parent and metabolite to mu-opioid receptors and inhibition of the reuptake of norepinephrine and serotonin. It is marketed in the United States for the treatment of moderate to moderately severe pain. Cases of abuse and dependence of tramadol have been reported. It is not controlled in the United States under the CSA or controlled internationally under the Psychotropic Convention or the Single Convention on Narcotic Drugs.

Zopiclone is classified as a nonbenzodiazepine hypnotic. The pure enantiomer (optical isomer) of zopiclone, eszopiclone, is marketed in the United States for the treatment of insomnia. The precise mechanism of action of eszopiclone as a hypnotic is unknown, but its effect is believed to result from its interaction with gamma-aminobutyric acid (GABA)-receptor complexes at binding domains located close to or allosterically coupled to benzodiazepine receptors. Eszopiclone and zopiclone are controlled domestically in Schedule IV of the CSA and are not controlled internationally under the Psychotropic Convention or Single Convention on Narcotic Drugs.

Buprenorphine is a semisynthetic opium derivative with partial mu-opioid receptor agonist activity. In the United States, buprenorphine is available as a parenteral product marketed for the relief of moderate to severe pain, as a sublingual single-entity tablet, and as a sublingual combination tablet with naloxone. The sublingual tablets are used for the treatment of opiate addiction. Buprenorphine is controlled domestically in Schedule III of the CSA as a narcotic and is controlled internationally in Schedule III of the Psychotropic Convention.

Oripavine is a phenanthrene alkaloid contained in the species of the *Papaver* plant. It is a chemical derivative of thebaine, a naturally-occurring substance found in the opium plant. Oripavine is controlled domestically in Schedule II of the CSA because it is a derivative of thebaine, opium, and other opiates. Oripavine is not under international control.

### III. Opportunity to Submit Domestic Information

As required by section 201(d)(2)(A) of the CSA (21 U.S.C. 811(d)(2)(A)), FDA, on behalf of HHS, invites interested persons to submit comments regarding the nine named drugs. Any comments received will be considered by HHS when it prepares a scientific and medical evaluation of these drugs. HHS will forward a scientific and medical evaluation of these drugs to WHO, through the Secretary of State, for WHO's consideration in deciding whether to recommend international control/decontrol of any of these drugs. Such control could limit, among other things, the manufacture and distribution (import/export) of these drugs and could impose certain recordkeeping requirements on them.

HHS will not now make any recommendations to WHO regarding whether any of these drugs should be subjected to international controls. Instead, HHS will defer such consideration until WHO has made official recommendations to the Commission on Narcotic Drugs, which are expected to be made in early 2006. Any HHS position regarding international control of these drugs will be preceded by another **Federal Register** notice soliciting public comments as required by section 201(d)(2)(B) of the CSA.

### IV. Comments

Interested persons may submit to the Division of Dockets Management (see **ADDRESSES**) written or electronic comments regarding the drugs. The abbreviated comment period is necessary to allow sufficient time to prepare and submit the domestic information package by the deadline imposed by WHO. Two copies of any comments are to be submitted, except that individuals may submit one copy. Comments are to be identified with the docket number found in brackets in the heading of this document. Received comments may be seen in the Division of Dockets Management between 9 a.m. and 4 p.m., Monday through Friday.

Dated: December 5, 2005.

**Jeffrey Shuren,**

*Assistant Commissioner for Policy.*

[FR Doc. 05-23958 Filed 12-12-05; 8:45 am]

**BILLING CODE 4160-01-S**

## DEPARTMENT OF HEALTH AND HUMAN SERVICES

### National Institutes of Health

#### Government-Owned Inventions; Availability for Licensing

**AGENCY:** National Institutes of Health, Public Health Service, HHS.

**ACTION:** Notice.

**SUMMARY:** The inventions listed below are owned by an agency of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally-funded research and development. Foreign patent applications are filed on selected inventions to extend market coverage for companies and may also be available for licensing.

**ADDRESSES:** Licensing information and copies of the U.S. patent applications listed below may be obtained by writing to the indicated licensing contact at the Office of Technology Transfer, National Institutes of Health, 6011 Executive Boulevard, Suite 325, Rockville, Maryland 20852-3804; telephone: 301/496-7057; fax: 301/402-0220. A signed Confidential Disclosure Agreement will be required to receive copies of the patent applications.

#### Tri-Functional Nanospheres

Yun-bo Shi (NICHD) *et al.*  
U.S. Patent Application No. 11/135,380  
filed 24 May 2005 (HHS Reference  
No. E-145-2005/0-US-01).

*Licensing Contact:* Cristina  
Thalhammer-Reyero; 301/435-4507;  
*thalhamc@mail.nih.gov.*

Available for licensing and commercial development is an invention related to "biofunctional" tri-functional nanospheres (TFNs) or multi-functional nanospheres (MFNs) obtained by binding one or more biomaterials, such as folate, IgG, biotin or streptavidin, to fluorescent-magnetic bifunctional nanospheres (BFNs). Unlike other BFNs available, which are virtually all based on having a magnetic core, the present invention is based on mesoporous BFNs with hydrophobic inner cavities. The properties of the TFNs of the subject invention have superior qualities for use for the various applications that require aqueous solutions.

Nanospheres are becoming the materials of choice for a rapidly increasing number of pharmaceutical and biomedical applications, including the use of quantum dots (QDs) and magnetic nanoparticles. Materials with

the combined function of fluorescent labeling and magnetic separation have many applications in biomedical science, including those resulting from the encapsulation of both particles in polymer microcapsules. However, these related prior technologies are predominantly dependent on core-shell type technologies. Typically, a magnetic material such as magnetite or a fluorescent particle such as a QD is used as a core. Such a core-shell structure is chemically unstable and disadvantageous for fluorescence applications because the shell tends to absorb either or both of the excitation and emission lights, thus dimming the fluorescent signal. The nanoparticles of this invention are composed of a mesoporous copolymer, a magnetic material embedded into the mesoporous copolymer, a fluorescent nanomaterial concurrently embedded into the mesoporous copolymer, and one or more biomaterials coupled to the mesoporous copolymer.

TFNs and MFNs have multiple uses. When the TFNs are labeled by a single biomaterial, the nanoparticles may specifically bind to a cell, or a protein or any other moiety that to which the biomaterial specifically binds. For instance, the biomaterial may be a small molecule ligand that is specifically bound by a cell surface receptor. MFNs in which two bioagents are coupled to single BFNs allow using one bioagent to target a macromolecule or a cell and using the second one to alter the function/properties of the macromolecule or cell, *e.g.*, using a protein to target a cell and using a toxin or cell death protein to kill the targeted cell, or using a chemical or protein to target a protein within a complex and another one to alter the function of a different component of the complex.

The technology is further described in "Biofunctionalization of fluorescent-magnetic-biofunctional nanospheres and their applications," Guo-Ping Wang, Er-Qun Song, Hai-Yan Xie, Zhi-Ling Zhang, Zhi-Quan Tian, Chao Zuo, Dai-Wen Pang, Dao-Cheng Wu and Yun-Bo Shi; *Chemical Communications*, 2005, (34), 4276-4278; DOI: 10.1039/b508075d.

In addition to licensing, the technology is available for further development through collaborative research opportunities with the inventors.

#### Efficient Growth of Wild-Type Hepatitis A Virus in Cell Culture for Development of Live Vaccines

Gerarado Kaplan and Krishnamurthy Konduru (FDA).