Madhu Biyani

Physician (India), Ph.D. (Japan)

[Nationality: Citizen of India and Permanent Residence of Japan]

Academic career:

- **B.H.M.S. (Doctor in Bachelor of Homoeopathy Medicine and Surgery)** from University of Rajasthan, INDIA **(July 2000).** [enclosure: p12]
- **Ph.D. (Doctor of Engineering)** in Bioengineering from Saitama University, JAPAN **(March 2011).**

  Title: Development of a general method to create a protease activity-enhancing peptide aptamers for drug discovery. [enclosure: p13-14]
- **Japanese-Language Proficiency Test-N3 Level** [enclosure: p15-16]

Research and Professional Career:

- 01/2006 - 09/2007: Researcher in REDS Group (Rational Evolutionary Design of Advanced Biomolécules, Saitama), CREATE (JST), Japan [enclosure: p17]
- 04/2009 - 03/2013: Research associate in City Area Project (JST), Saitama University, Japan [enclosure: p18]
- 12/2012 - 3/2014: Research associate in Sentan Project (JST), Saitama University, Japan [enclosure: p19-20]
- 4/2014 – 9/2014: Post doc researcher in CoI project, Kaneko lab, School of Materials Science, JAIST, Japan [enclosure: p21]

Contacts:

- Present Residence: E42, Asahidai 1-50, Nomi, Ishikawa 923-1211, Japan
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List of Publications

Patent:

[1] Koichi Nishigaki, Koichiro Kitamura, Madhu Biyani, Masae Futakami, Kenji Yamamoto, Tomoyo Kawakubo. Peptide selected (Materials patent), Patent Application No.: 2009-245763, filing date: October 26, **2009.**

Journal Papers (International):

[1] Madhu Biyani, Masae Futakami, Koichiro Kitamura, Miho Suzuki, Tomoyo Kawakubo, Kenji Yamamoto and Koichi Nishigaki. *In vitro* selection of cathepsin E-activity-enhancing peptide aptamers at neutral pH. ***International Journal of Peptides (*2011)** doi:10.1155/2011/834525.

[2] Koichiro Kitamura, Madhu Biyani, Masae Futakami, Miho Suzuki, Tomoyo Kawakubo, Kenji Yamamoto and Koichi Nishigaki. Peptide aptamer-based ELISA-like system for detection of cathepsin E in tissues and plasma. ***J Mol Biomark Diagn.*** (**2011)**, 2:104. doi:10.4172/2155-9929.1000104.

[3] Manish Biyani, Madhu Biyani, Naoto Nemoto, Takanori Ichiki, Koichi Nishigaki, Yuzuru Husimi. Gel-shift selection of translation enhancer sequences using mRNA display. ***Analytical Biochemistry,* (2011)** Feb 1; 409(1):105-11.

[4] Koichiro Kitamura, Masayuki Komatsu, Madhu Biyani, Tomovo Kawakubo, Kenji Yamamoto, and Koichi Nishigaki. Proven in vitro evolution of protease cathespsin E- inhibitors and activators at pH 4.5 using a paired peptide method. ***J Pept Sci.* (2012)** Oct 30. doi : 10. 1002/psc.2453.

[5] Masayuki Komatsu, Madhu Biyani, Sunita Ghimire Gautam and Koichi Nishigaki. Peptide-modulated activity enhancement of acidic protease cathepsin E at neutral pH. ***International Journal of peptide* (2012)** 2012, Article ID 316432.

[6] Koichiro Kitamura, Madhu Biyani, Taku Ozawa, Miho Suzuki, Naoto Nemoto, and Koichi Nishigaki. Alpha-strand peptide scaffold: a novel and simple peptide conjugating approach for improving the function of peptide in pep-ELISA. ***J Mol Biomark Diagn.*** (under communication)

[7] Madhu Biyani, Sunita Ghimire Gautam, Masayuki Komatsu, Sachika Tsuji-Ueno, Manish Biyani and Koichi Nishigaki. Proven evolution of proteins: Progressive Library Method in in-vitro evolution. ***Brief. Funct. Genomics*** (to be submitted).

Journal Papers (National):

[8] Takuyo Aita, Yasunori Kinoshita, Masae Futakami, Md. Salimullah, Madhu Biyani, Sachika Tsuji, Masaki Shibuya, Osamu Takei, Koichiro Kitamura, Naoto Nemoto, and Koichi Nishigaki. ***Report of Comprehensive Open Innovation Center***, Saitama University (**2008**).

[9] Koichi Nishigaki, Takafumi Sakai, Naoto Nemoto, Akihito Adachi, Hidekazu Uchida, Yuki Hasegawa, Takuyo Aita, Shingo Ueno, Masae Futakami, Koichiro Kitamura, Madhu Biyani, Kenji Yamamoto, Tomoyo Kawakubo, Atsushi Agouchi, Kenji Sakimura, Manabu Abe, Yuko Hotta, Hitoshi Goto, Mikio Tomida, Tatsuya Tominaga, Hideo Nakajima, Kenjyu Miura, Tomojirou Hayashi, Shigenari Kukizaki, Masaki Shibuya, Osamu Takei, Kiyoshi Takayama, Satomi Takizawa, Takizawa, Takuto Ose, ***Report of Comprehensive Open Innovation Center***, Saitama University (**2009**).

Book chapters:

[10] Manish Biyani, Madhu Biyani, Naoto Nemoto, Yuzuru Husimi. Evolutionary molecular engineering to efficiently direct in vitro protein sysnthesis. In: ***Protein Synthesis***, ISBN-980-953-307-170-6, InTech Publisher, Croatia (**2012**).

[11] Madhu Biyani, Koichi Nishigaki, and Manish Biyani. Biomolecular Display Technologies for Biomedical Research and Drug Discovery. In: ***Animal Biotechnology***. Elsevier Publisher (to be appeared in July 2013).

Conferences Papers (International):

[1] Madhu Biyani, Koichi Nishigaki. Peptide-aptamer -based drug development for cancer. ***BICON 2012, Drug-development: a Collaborative Approach of Chemist and Biologist*** **(**September 2012) (**Oral**)

[2] Madhu Biyani, Koichiro Kitamura, Koichi Nishigaki. Peptide-based ELISA-like system for cancer diagnosis. ***BICON 2011, Innovation in the Latest Healthcare Issues*** (September 2011*)* (**Oral**)

[3] Madhu Biyani, Masae Futakami, Koichiro kitamura, Tomoyo Kawakubo, Miho Suzuki, Kenji Yamamoto, Koichi Nishigaki. Screening of protease-activating peptide aptamers at neutral pH aiming for the cancer therapeutics (***BMB 2010***, Dec.7-10 Kobe) (**Poster**)

[4] Madhu Biyani, Koichi Nishigaki. Protease-activating peptide aptamers: a novel approach for the bio drug discovery aimed for cancer. ***5th Indo-Japan Conference on Innovative Molecular Approaches in Global Health Research*** (September, 2010) (**Oral**)

[5] Koichi Nishigaki, Koichiro Kitamura, Chuya Yoshida, Masae Futakami, Madhu Biyani, Sachika Ueno-Tsuji. Strategy and technology for the evolution of novel proteins: Progressive Library Method (***Bio-Physical Society of Japan 2010***, Sept, Sendai) (**Poster**)

[6] Madhu Biyani, Masae Futakami, Koichiro Kitamura, Koichi Nishigaki. Selection of cathepsin E-activating peptides at neutral pH using a Progressive Library Method (***Molecular Biology Society of Japan 2009***, Dec 9-12,Yokohama) (**Poster**)

[7] Masae Futakami, Madhu Biyani, Koichiro Kitamura, Koichi Nishigaki. Paired peptide method effective for advancing cathepsin E-activating activities of peptides (***Molecular Biology Society of Japan 2009***, Dec 9-12, Yokohama) (**Poster**)

[8] Koichiro Kitamura, Madhu Biyani, Masae Futakami, Tomoyo Kawakubo, Kenji Yamamoto, Koichi Nishigaki. Application of cathepsin-E specific binding peptides for a diagnostic reagent kit (***Molecular Biology Society of Japan 2009***, Dec 9-12, Yokohama) (**Poster**)

[9] Madhu Biyani and Koichi Nishigaki**.** Peptide technology for next generation targeted biotherapeutics. ***4th Indo-Japan Conference on Nanotechnology and Healthcare in the Developing world*** (September, 2009) (**Oral**)

[10] 西垣功一、北村幸一郎、木下保則、吉田昼也、モハメド・サリムラ、辻幸香、上野真吾、マドゥ・ビヤーニ、二上雅恵[1]、高橋陽子、マニッシュ・ビヤーニ、澁谷昌樹、武居修、浅見雄太、鈴木美穂、根本直人、モハメド・ナイムジン、二木類、相田拓洋、内田秀和、後藤仁志、山本健

二、草木稔篤、花田和則、大関正弘、伏見譲, 高速分子進化技術 eRAPANSY：未来型創薬ツール. **(*BMB 2008,*** Dec. 9-12 Kobe**) (Poster).**

[11] Madhu Biyani and Koichi Nishigaki**.** Peptide Pairs: a novel approach for directed evolution of Cathepsin-E inhibitor/activator. ***3rd Indo-Japan Conference on Facilitating interdisciplinary biotech for future entrepreneurship*** (August, 2008) (**Oral**)

[12] Madhu Biyani and Koichi Nishigaki**.** Synergy of Evolutionary Biology and future of Biotech in Medicine. ***2nd Indo-Japan Conference on Research-based Education*** (June, 2007) (**Oral**)

[13] Madhu Biyani and Koichi Nishigaki**.** Evolutionary Biotechnologies: Understanding the origin of life for future biotech. ***1st Indo-Japan Conference on Research-based Education*** (June, 2006) (**Oral**)

[14] Madhu Biyani and Koichi Nishgiaki. Control of cell-free translation initiation by evolving a universal regulatory sequence using genotype-phenotype linking technology. ***International Conference in Bio-Physics***, Kyoto, Japan (July, 2006) (**Poster**).

Conferences papers (National):

[15] Madhu Biyani, Koichiro Kitamura, Masae Futakami, Tomoyo Kawakubo, Kenji Yamamoto, Koichi Nishigaki. ***15th Japan Society for Proteases in Pathophysiology*** (CPIPT 2010, August 21-21,Osaka) (**Oral & Poster**)

[16] Koichiro Kitamura, Madhu Biyani, Masae Futakami, Tomoyo Kawakubo, Kenji Yamamoto, Koichi Nishigaki. ***14th Japan Society for Proteases in Pathophysiology*** (CPIPT 2009, August 21-22,Osaka) (**Oral & Poster**)

Awards and Achievements

[1] Obtained national scholarship from Government of India for getting first rank in Secondary Board Examinations.

[2] Obtained Shri T.W. Lala Smarati Prize for getting higher marks in Senior Higher Secondary Examinations.

[3] Obtained outstanding academic award certificate and cash prize from Homeopathic medical association of India, Ajmer Unit.

[4] Obtained appreciation letter from Tigers Welfare society for participation in social activities.

[5] Obtained appreciation letter from Government of Rajasthan, paryavaran Department for participation in essay writing competition.

[6] Obtained Certificate for Participation in National Homeopathic Conference held in Jaipur.

[7] Obtained 3rd rank in Japanese language contest in Saitama organized by WFWP program.

[8] Obtained Prize for High School lecture about Indian culture in Saitama.

Brief description of previous researches

The most important Scientific achievements from my past research are based on my great interest as a being researcher and physician to discover the therapeutic biomolecules such as highly functional peptide aptamers for the most incurable diseases such as cancer by mainly advancing the *in vitro* evolution method. These are grouped in major three projects and are briefly described below:

I. Development of progressive library method and its application to generation of peptide-aptamer-based inhibitors and activators of Cathepsin E.

Molecules of high activity (affinity) are essential tools for both diagnostics and target therapeutics. However, to identify such molecules *ab initio* is not so difficult than to further improve their particular function. Here, we developed a selection method, called 'progressive library method (PLM)' to acquire highly affinity and functional peptides. This is an advanced, systemic *in vitro* evolution, and integrated method that equipped with three successive library constructions and selections that offers advantages for the construction of succeeding libraries based on the previous library selection information and for the enrichment of molecules based on high activity (e.g., enzyme-inhibition and -activation) and not merely binding affinity. Herein, the primary library selection provides the search of particular functional peptides (inhibitors, activators, or binders) from the huge random peptides library and enriches the library with peptides of marginal range of affinities and functions. The selected peptides from primary library are divided into blocks of 4 amino acids and recombined again by block shuffling method for preparing the secondary library for next round selection. Finally, the selected peptides from secondary library were further converted to randomly generate paired peptides library that plays the most critical role to further elevate the affinity and function of the peptides at the highest level. Herein, the primary, secondary, and tertiary library selections can be regarded as module-finding, module-shuffling and module pairing, respectively, which closely resembles the progression of the natural evolution of proteins. Thus, PLM represents an effective approach to assist evolutionary protein engineering to meet the demands of modern drug discovery as well in harmony of protein science.

Achievements:

1) A 'Progressive Library Method' is successfully developed and applied to select peptide aptamer against cathepsin E (CE), an aspartic protease that has been associated to induce apoptosis in cancer cells. CE-activator peptides were obtained at acidic pH with the ultra-high affinity (~100 pM dissociation constant) and the highest CE activity (47.8%).
2) This is the first time that the activity enhancing binding peptides were selected successfully at neutral pH with the highest affinities (peptide of 300 nM $K_{D,}$ selected from the secondary library and peptide of improved 2 nM $K_{D,}$ selected from the third library) against CE. The presence of these peptides in apoptosis induction *in vivo* assay which increased the enhancing of CE-activity and induced cell apoptosis indicates their potential to act as cancer drug precursors.
3) This work resulted **one patent** and **three journal articles** (*Int. J. Pept.,* 2011; *Int. J. Pept.,* 2012*; J. Pept. Sci.,* 2012). The work was also presented as talks and posters in **9** national and international meetings. This work also brought the winning award for the best young investigator in 17th Japan Society of Pathology of Protease (CPIPT, 2012).

Recently, PLM was demonstrated successfully by other researchers to acquire the novel higher affinities peptide aptamers against various therapeutic targets including **Aβ42 oligomers** (for Alzheimer's disease) (*Protein Pept. Lett.,* 2011), **NM23** (for Cancer) and **SOD1** (for Motor neuron disease).

II. Development of Peptide aptamer-based ELISA-like system for detection of cathepsin E in tissue and plasma.

ELISA (enzyme-linked immunosorbent assay) is a highly sensitive and powerful molecular detection tool which is based on antibodies. However, antibodies are associated with several drawbacks such as their high cost production and large size. In this study, we reported two types of peptide-based ELISA-like systems (pep-ELISA). One is enzyme-on-peptide, which is much simpler as it consists of a peptide and a target enzyme only. The other mimics the conventional sandwich ELISA where antibodies are replaced with peptides. These constructs were confirmed to be effective

using the tissues and blood specimens extracted from CE-wild type and knockout rats.

Achievements:

1) A novel peptide aptamer-based technology, 'pep-ELISA' (as a promising substitution for antibodies-based method), was developed and demonstrated successfully with sufficient sensitivity (10 μg/ml) for the detection of CE in tissues and plasma.
2) This work resulted in **one journal article** (*Mol. Biomarkers Diagnosis,* 2011) and talks in **2** national and international meetings.

III. In vitro selection of new regulatory sequence for efficient initiation of cell-free protein synthesis.

In this work, we developed a new approach for selection of translation enhancer sequences that enables efficient protein synthesis in cell-free systems. The selection is based on a gel shift assay of a messenger RNA (mRNA)-protein fusion product that is synthesized in a cell-free translation system using an mRNA display method.

Achievements:

1) An efficient translation enhancer sequence capable of more rapid initiation of cell-free protein synthesis, with a minimal translation time of 5 min, than a natural longer enhancer sequence (β-globin) was successfully selected using rabbit translation system. This work resulted in one journal article (Anal-Biochem 2011) and honored by Elsevier Publication as one of the key scientific finding and highlighted on the **Front cover page** of *Analytical Biochemistry* Journal (issue 209, 2011). The work was awarded by JB OUP prize with exceptional value from IUBMB International Union of Biochemistry and Molecular Biology Society in 2006.

Experimental Exposure

The following list shows some of the experimental techniques and procedures with which I am familiar and used in my research work.

- Protein purification, protein-immobilization by amine coupling method
- *In vitro* display technology e.g. mRNA /cDNA display
- K_d measurement using Biacore SPR method
- Polymerase Chain Reaction
- Transcription, *In vitro* protein translation, Reverse transcription
- DNA/RNA manipulation (isolation, purification, precipitation).
- Agarose gel electrophoresis, SDS-PAGE
- Enzyme activity assay
- Enzyme Kinetics, Restriction digestion and molecular biology techniques.
- Fluorescence microscopy imaging.
- BrdU labeling, sectioning and cresyl violet and other staining related to immunohistochemical studies.
- Cloning, sequencing.
- Micro gel electrophoresis, Micro temperature gel gradient electrophoresis
- NMR and FTIR spectroscopy
- NCA synthesis using triphosgene
- Polypeptide synthesis by NCA ring opening polymerization (ROP) method using trans transition metal initiators.
- Polypeptide synthesis characterization by NMR, IR, MS, GPC, TGA, CD
- Glove-box
- Thiol-ene photo addition click chemistry
- Organic compounds purification
- Protection of amino group of amino acid by CBZ and alloc protection groups.
- Film casting of synthesized polypeptide.

Names and contact addresses of references

Name: **Koichi NISHIGAKI**

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Name: **Yuzuru HUSHIMI**

Affiliation: Professor in President Office, Graduate University of Advanced Studies (SOKENDAI), Japan

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Name: **Tatsuo KANEKO**

Affiliation: Associate Professor, School of Material Science, JAIST, Japan.

E-mail: kaneko@jaist.ac.jp; Phone: 0761-51-1631

English version of the original Degree in Hindi

Roll No. 36

We, the Chancellor, Vice-Chancellor and the Members of the Senate of the

University of Rajasthan

(JAIPUR)

Certify that

Ms. Madhu Maheshwari

of Dr. M. P. Khuteta Rajasthan Homoeopathic Medical College, Jaipur

having been examined for the Degree of Bachelor of Homoeopathic Medicine and Surgery in 2000 (July) and found qualified for the same, the Degree of

Bachelor of Homoeopathic Medicine and Surgery

has been conferred on her.

In Testimony whereof are set the Seal of the said University and the signature of the said Vice-Chancellor.

UNIVERSITY OF RAJASTHAN 19 47

Vice-Chancellor

Jaipur, Dated October 2, 2001

Issued on 12. 03. 2014

博理工乙第192号

学　位　記

インド

Madhu BIYANI

1974年7月8日生

本学に学位論文を提出し所定の
審査及び試験に合格したので
博士（工学）の学位を授与する

平成23年3月23日

埼玉大学長

上井喜彦

Saitama University

It is hereby certified that

Madhu BIYANI
Date of Birth: July 8, 1974
Nationality: India

having fulfilled all of the requirements of the University

and having satisfied the examiners

was admitted to

the degree of

Doctor of Engineering

on March 23, 2011

Degree Number: 192

Yoshihiko Kamii

Kamii, Yoshihiko
President
Saitama University
Saitama, Japan

This is an authorized translation of the original

N3
レベル Level

日本語能力試験
認定結果及び成績に関する証明書

JAPANESE-LANGUAGE PROFICIENCY TEST
CERTIFICATE OF RESULT AND SCORES

公益財団法人 日本国際教育支援協会
理事長 井 上 正 幸
Masayuki Inoue
President
Japan Educational Exchanges and Services

独立行政法人 国際交流基金
理事長 安 藤 裕 康
Hiroyasu Ando
President
The Japan Foundation

2013 年 12 月 1 日に、公益財団法人日本国際教育支援協会及び独立行政法人国際交流基金が実施した日本語能力試験に関し、認定結果及び成績を次のとおり証明します。

This is to certify the result and the scores of Japanese-Language Proficiency Test given on December 1 , 2013 jointly administered by Japan Educational Exchanges and Services and the Japan Foundation .

発 行 日 Date of Issue (y/m/d)	2014/03/17

受験番号 Registration No.	110130150
氏 名 Name	MADHU BIYANI
生年月日 Date of Birth (y/m/d)	1974/12/08
受 験 地 Test Site	日本 Japan

レ ベ ル Level	N3
結 果 Result	合格 Passed
認定番号 Certification No.	N3A022066J

得点区分別得点 Scores by Scoring Section			
言語知識(文字・語彙・文法) Language Knowledge (Vocabulary/Grammar)	読解 Reading	聴解 Listening	総合得点 Total Score
39 / 60	60 / 60	49 / 60	148 / 180

公益財団法人日本国際教育支援協会及び独立行政法人国際交流基金は、日本国内及び海外において、原則として日本語を母語としない者を対象として、日本語能力を測定し認定するために、日本語能力試験を実施しています。この試験において認定を受けた人の各レベルの「認定の目安」は、以下のとおりです。

N1：幅広い場面で使われる日本語を理解することができる
【読む】・幅広い話題について書かれた新聞の論説、評論など、論理的にやや複雑な文章や抽象度の高い文章などを読んで、文章の構成や内容を理解することができる。
・さまざまな話題の内容に関わりのある読み物を読んで、話の流れや詳細な表現意図を理解することができる。
【聞く】・幅広い場面において自然なスピードの、まとまりのある会話やニュース、講義を聞いて、話の流れや内容、登場人物の関係や内容の論理構成などを詳細に理解したり、要旨を把握したりすることができる。

N2：日常的な場面で使われる日本語の理解に加え、より幅広い場面で使われる日本語をある程度理解することができる
【読む】・幅広い話題について書かれた新聞や雑誌の記事・解説、平易な評論など、論旨が明快な文章を読んで文章の内容を理解することができる。
・一般的な話題に関する読み物を読んで、話の流れや表現意図を理解することができる。
【聞く】・日常的な場面に加えて幅広い場面で、自然に近いスピードの、まとまりのある会話やニュースを聞いて、話の流れや内容、登場人物の関係を理解したり、要旨を把握したりすることができる。

N3：日常的な場面で使われる日本語をある程度理解することができる
【読む】・日常的な話題について書かれた具体的な内容を表す文章を、読んで理解することができる。
・新聞の見出しなどから情報の概要をつかむことができる。
・日常的な場面で目にする難易度がやや高い文章は、言い換え表現が与えられれば、要旨を理解することができる。
【聞く】・日常的な場面で、やや自然に近いスピードのまとまりのある会話を聞いて、話の具体的な内容を登場人物の関係などとあわせてほぼ理解できる。

N4：基本的な日本語を理解することができる
【読む】・基本的な語彙や漢字を使って書かれた日常生活の中でも身近な話題の文章を、読んで理解することができる。
【聞く】・日常的な場面で、ややゆっくりと話される会話であれば、内容がほぼ理解できる。

N5：基本的な日本語をある程度理解することができる
【読む】・ひらがなやカタカナ、日常生活で用いられる基本的な漢字で書かれた定型的な語句や文、文章を読んで理解することができる。
【聞く】・教室や、身の回りなど、日常生活の中でもよく出会う場面で、ゆっくり話される短い会話であれば、必要な情報を聞き取ることができる。

Japan Educational Exchanges and Services and the Japan Foundation administer the Japanese-Language Proficiency Test for the measurement and certification of Japanese-language proficiency for non-native speakers both in Japan and abroad. The summary of the linguistic competence required for each level is shown below.

N1: The ability to understand Japanese used in a variety of circumstances.
[Reading]
・One is able to read writings with logical complexity and/or abstract writings on a variety of topics, such as newspaper editorials and critiques, and comprehend both their structures and contents.
・One is also able to read written materials with profound contents on various topics and follow their narratives as well as understand the intent of the writers comprehensively.
[Listening]
・One is able to comprehend orally presented materials such as coherent conversations, news reports, and lectures, spoken at natural speed in a broad variety of settings, and is able to follow their ideas and comprehend their contents comprehensively. One is also able to understand the details of the presented materials such as the relationships among the people involved, the logical structures, and the essential points.

N2: The ability to understand Japanese used in everyday situations, and in a variety of circumstances to a certain degree.
[Reading]
・One is able to read materials written clearly on a variety of topics, such as articles and commentaries in newspapers and magazines as well as simple critiques, and comprehend their contents.
・One is also able to read written materials on general topics and follow their narratives as well as understand the intent of the writers.
[Listening]
・One is able to comprehend orally presented materials such as coherent conversations and news reports, spoken at nearly natural speed in everyday situations as well as in a variety of settings, and is able to follow their ideas and comprehend their contents. One is also able to understand the relationships among the people involved and the essential points of the presented materials.

N3: The ability to understand Japanese used in everyday situations to a certain degree.
[Reading]
・One is able to read and understand written materials with specific contents concerning everyday topics.
・One is also able to grasp summary information such as newspaper headlines.
・In addition, one is also able to read slightly difficult writings encountered in everyday situations and understand the main points of the content if some alternative phrases are available to aid one's understanding.
[Listening]
・One is able to listen and comprehend coherent conversations in everyday situations, spoken at near-natural speed, and is generally able to follow their contents as well as grasp the relationships among the people involved.

N4: The ability to understand basic Japanese.
[Reading]
・One is able to read and understand passages on familiar daily topics written in basic vocabulary and *kanji*.
[Listening]
・One is able to listen and comprehend conversations encountered in daily life and generally follow their contents, provided that they are spoken slowly.

N5: The ability to understand some basic Japanese.
[Reading]
・One is able to read and understand typical expressions and sentences written in *hiragana*, *katakana*, and basic *kanji*.
[Listening]
・One is able to listen and comprehend conversations about topics regularly encountered in daily life and classroom situations, and is able to pick up necessary information from short conversations spoken slowly.

注 記

1．不合格には認定番号がありません。認定番号は＊で示します。
2．一つでも欠席した科目があると、すべての科目を採点しません。得点は＊で示します。

Note

1．Certification Number is not provided to those who fail the test. Certification Number is indicated as ＊.
2．Examinees must take all sections of the test to receive a score. Otherwise, scores will be indicated as ＊.

（様式４）

在職及び職務内容等証明書

氏名 生年月日	Biyani Madhu 昭４９年７月８日生	在職期間	自 平１８年４月１日 至 平１９年９月３０日	退職月における給与月額	238,000 円

◎ 職歴及び職務内容

年月日	所属・職名	職務内容
平18. 4. 1	地域結集研究員	マイクロリアクターアレイ進化リアクターの開発 他

◎ 在職時の身分

勤務態様	☑ 常勤(正社員又は定員内職員) ☐ 非常勤(嘱託等) (週 時間) ※いずれか一方にレを付し，非常勤の場合は（ ）に週の勤務時間数を記入してください。
年金制度適用区分	☐ 国家公務員共済組合 ☐ 地方公務員等共済組合 ☑ 厚生年金 ☐ その他（ ） ※いずれかにレを付し，その他の場合は（ ）に年金制度名を記入してください。

◎ 会社の概要

商号	公益財団法人 埼玉県産業振興公社 （旧： 財団法人 埼玉県中小企業振興公社）
設立年月日及び資本金	昭４８年４月２６日 基本金５００万 円
従業員数	５５人 （うち被証明者が所属していた部門の員数） 人

上記のとおり相違ないことを証明します。

平成２６年３月１３日

所在地 埼玉県さいたま市大宮区桜木町1-7-5
ソニックシティビル10F

施設名 公益財団法人 埼玉県産業振興公社

役職・氏名 理事長 秋山 秀次郎 印

(様式4)

在職及び職務内容等証明書

氏名 生年月日	Madhu Biyani 1974年7月8日生	在職期間	自 H21年4月1日 至 H25年3月31日 ※空白期間なし	退職月における給料月額	円

◎ 職歴及び職務内容

年月日	所属・職名	職務内容
H 21.4.1	大学院理工学研究科 産学官連携研究員 (~H22.3.31)	研究 ※週20時間勤務
H 22.9.1	学務部大学院理工学研究科支援室 技術補佐員 (~H23.3.31)	技術補助 ※週28時間勤務
H 23.4.1	大学院理工学研究科 産学官連携研究員 (~H23.10.21)	研究 週28時間勤務 ※H23.6.1~週30時間勤務
H 24.12.10	同上 (~H25.3.31)	研究 ※週12時間勤務

◎ 在職時の身分

勤務態様	□ 常勤(正社員又は定員内職員) ☑ 非常勤(嘱託等)(週 時間) ※いずれか一方にレを付し，非常勤の場合は( )に週の勤務時間数を記入してください。
年金制度適用区分	□ 国家公務員共済組合 □ 地方公務員等共済組合 ☑ 厚生年金 □ その他( ) ※週30時間勤務時のみ ※いずれかにレを付し，その他の場合は( )に年金制度名を記入してください。

◎ 会社の概要

商号	
設立年月日及び資本金	年 月 日 円
従業員数	人 (うち被証明者が所属している部門の員数) 人

上記のとおり相違ないことを証明します。

平成26年3月4日

所在地 埼玉県さいたま市桜区下大久保255
施設名 埼玉大学大学院理工学研究科
役職・氏名 埼玉大学大学院理工学研究科長
佐藤勇一 印

研　究　従　事　内　容　調　書

研究従事を許可された機関名等	埼玉大学大学院　理工学研究科
氏　　名	Madhu Biyani　（マドゥ・ビヤーニ）
研究従事期間	２０１３年　６月　１日から　　２０１４年　３月　８日まで
研究従事態様	１週平均　　８時間，　　１日平均　　４時間

（研究の内容）

仕事の内容は、研究室で進めている研究の英語論文作成作業であり、その中心は“pepELISA法の確立と応用技術の開発”に関するものでした。

（その他参考となる事項及び研究業績等）

乳児を抱えておられるというご家庭の都合で、勤務時間は週に6～12時間程度の短時間でしたが、内容は高度な専門性の要求される作業でした。短期日（途中、1月あまりのインド帰省含む）ではありましたが、一定の成果を仕上げてくださり、1つには特許申請という形で結実し、もう一つには論文投稿（"α-helix-stand peptide-supported expression of functional peptides (仮題)"）に結びつきつつあります。

上記のとおり相違ないことを証明する。

平成26年　3月　１９日

指導教員所属・職・氏名
埼玉大学大学院理工学研究科・教授
西垣　功一

平成26年3月19日 12時39分01秒

Saitama University
埼玉大学
Department of Functional Materials Science
Graduate School of Science and Engineering
Saitama University

研究補助員としての就業証明

Madhu Biyani さんは、2013 年 6 月から 2014 年 3 月上旬まで、埼玉大学大学院理工学研究科機能材料工学コースに所属する西垣研究室において、博士学位取得者（ポスドク）の立場で、私、教授の西垣の研究補助をされました。仕事の内容は、研究室で進めている研究の英語論文作成作業であり、その中心は“pepELISA 法の確立と応用技術の開発”に関するものでした。乳児を抱えておられるというご家庭の都合で、勤務時間は週に 6～12 時間程度の短時間でしたが、内容は高度な専門性の要求される作業でした。短期日（途中、1 月あまりのインド帰省含む）ではありましたが、一定の成果を仕上げてくださり、1 つには特許申請という形で結実し、もう一つには論文投稿（"α-helix-stand peptide-supported expression of functional peptides (仮題)"）に結びつきつつあります。

以上のように、標記の期間、ポスドクという立場からの研究をされたことを保証します。

平成 26 年 3 月 12 日

埼玉大学大学院　理工学研究科
教授　西垣　功一

255 Shimo-Okubo Sakura-Ku Saitama 338-8570

平成 26 年 2 月 28 日

（研究員・産学官連携研究員・ＶＢＬ研究員・教務補佐員・博士課程研究員）　採用予定者調書

研究代表者の所属職名・氏名		【所属】マテリアルサイエンス研究科 【職名】准教授 【氏名】山口　政之
研究課題等名		革新材料による次世代インフラシステムの構築
研究課題等名（英語表記）注 1		Construction of Next-generation Infrastructure Systems by Innovative Materials
研究支援者	配属先	マテリアルサイエンス研究科
	（フリガナ） 氏　名	マドゥ　ビヤニ Madhu Biyani（女）
	生年月日	昭和 49 年 7 月 8 日
	研究支援者が学生の場合	【研究科・課程】　　研究科　　課程　【学年】　年
	雇用期間	平成 26 年 4 月 1 日　～　平成 27 年 9 月 30 日
	勤務態様	【勤務日】　　月曜日　～　金曜日（その他　　） 【勤務時間】８：３０～１７：１５（休憩時間 12：00～13：00） （週３８時間４５分勤務）
	経　費	産学連携等研究費（受託：ＪＳＴ・ＣＯＩ・マテ：山口教授）
	再採用の予定	有
	連絡先	【電話】０７６１－５１－１６３３ 【E-mail】madhubiyani@yahoo.com