Information on Doctoral Thesis of Fellows Nguyen Thi Kim Giang

1. Full name: Nguyen Thi Kim Giang

2. Sex: Female

3. Date of birth: 20/7/1983

4. Place of birth: Ha Noi

5. Admission decision number: Decision No. 3201/QĐ-SĐH, 08th November 2010 (President of VNU)

6. Changes in academic process:

7. Official thesis title: *Synthesis and properties of some per-O-acetylglycopyranosyl thiosemicarbazones of substituted isatins*

8. Major: *Organic Chemistry*

9. Code: 62440114

10. Supervisors: Prof. Dr. Nguyen Dinh Thanh

11. Summary of the new findings of the thesis

- Preparing **19** substituted isatins using Sandmeyer' method, by bromination, nitration, alkylation of different isatins by microwave-assisted heating method.

- Synthesizing **36** new substituted isatin *N*-(tetra-*O*-acetyl-β-D-glycopyranosyl)thiosemicarbazones from corresponding *N*-(tetra-*O*-acetyl-β-D-glycopyranosyl)thiosemicacbazides by microwave-assisted heating method.

- Transfomating **8** substituted isatin *N*-(tetra-*O*-acetyl-β-D-glycopyranosyl)-thiosemicarbazones into new corresponding 3'-acetyl-5'-[(tetra-*O*-acetyl-β-D-glycopyranosyl)acetamido]-3'*H*-spiro[indoline-3,2'-[1,3,4]thiadiazol]-2-ones by reation with acetic anhydride.

- Performing the solid-phase reaction of **10** substituted isatin *N*-(tetra-*O*-acetyl-β-D-glycopyranosyl)thiosemicarbazones into new corresponding 5'-[(tetra-*O*-acetyl-β-D-glycopyranosyl)amino]-3'*H*-spiro[indoline-3,2'-[1,3,4]thiadiazol]-2-ones in the presence of the mixture of $KBrO_3$, KBr and oxalic acid as promoter by grinding method.

- Deacetylating **7** substituted isatin *N*-(tetra-*O*-acetyl-β-D-glycopyranosyl)-thiosemicarbazones into corresponding new substituted isatin *N*-(β-D-glycopyranosyl)-thiosemicarbazones by using CH_3ONa in methanol.

- The structure of all the compounds synthesized are confirmed by modern spectroscopic methods (IR, ^{1}H NMR, ^{13}C NMR) combined the 2D NMR techniques (COSY, HSQC, HMBC) and MS.

- Exploring bioactivities of synthesized compounds, as following:

+ Testing antibacterial and antifungal activities of 27 substituted isatin *N*-(tetra-*O*-acetyl-β-D-glycopyranosyl)thiosemicarbazones. The obtained results showed that the compounds **7b, c, e, i, k, l, m** inhibit to *S. epidermidis* and *K. pneumonia*, the compounds **7n, r, u** inhibit to *S. aureus*, the compounds **8h, i** have the inhibition to *E. coli*, almost the compounds have the inhibition to *C. albicans*.

+ Testing antibacterial and antifungal activities of 7 componds of 5'-[(tetra-*O*-acetyl-β-D-glycopyranosyl)amino]-3'*H*-spiro[indoline-3,2'-[1,3,4]thiadiazole]-2-ones. The obtained results showed that these compounds have no activity on *E. coli* và *P. Aeruginosa*, the compound **11i** has activity on *S. aureus*, the compounds **12g** và **12r** have activity on *A. Niger*.

+ The free radicals scavenging activity is estimated with DPPH of 7 glucopyranosylthiosemicarbazone compounds. The results showed that these compounds are not likely to catch radicals should not used as antioxidants.

12. Paratical applicability, if any:

The results obtained in this thesis have contributed to enrich the thiosemicarbazon compound containing monosaccharide and isatins toward synthesis, the ability of the transformation of these compounds. Besides, the results of the exploration potential antibacterial, antifungal of the synthesized substance in the thesis will be the suggestions in the search for bioactive compounds.

13. Further research directions, if any:

- Continuing to study the direction of transformation of *N*-(tetra-*O*-acetyl-β-D-glycopyranosyl)thiosemicarbazones of isatin with thioglycolic acid, ethyl chloroacetate, ω-bromoacetophenone.

- Investigation of ability to form Mannich's bases of *N*-(tetra-*O*-acetyl-β-D-glycopyranosyl)thiosemicarbazones of substituted isatin.

14. Thesis-related publications:

- Nguyen Dinh Thanh, **Nguyen Thi Kim Giang** (2011), "NMR spectra of tetra-*O*-acetyl-β-D-glucopyranosyl thiosemicarbazones", *Vietnam Journal of Chemistry* 49(N2ABC), pp. 646–650.

- Nguyen Dinh Thanh, **Nguyen Thi Kim Giang** (2011), "Microwave-assisted synthesis of novel tetra-O-acetyl-β-D-glucopyranosyl thiosemicarbazones of substituted isatins", *Lett. Org. Chem.* 8(7), pp. 500–503.

- Nguyen Dinh Thanh, **Nguyen Thi Kim Giang** Tran Ha Quyen, (2011), "Reaction of some substituted isatin with per-*O*-glucopyranosyl thiosemicarbazones", *Vietnam Journal of Chemistry* 49(5), pp. 537–541.

- Nguyen Dinh Thanh, **Nguyen Thi Kim Giang** (2011), "Isatin per-*O*-glucopyranosyl thiosemicarbazones", *In Proceedings of the 15th Int. Electron. Conf. Synth. Org. Chem.*, Sciforum Electronic Conferences Series, c001.

- Nguyen Dinh Thanh, **Nguyen Thi Kim Giang**, (2011) "Isatin (per-O-acetyl-β-D-galactopyranosyl)thiosemicarbazones", *InProceedings of the 15th Int. Electron. Conf. Synth. Org. Chem.*, Sciforum Electronic Conferences Series, c003.

- Nguyen Dinh Thanh, **Nguyen Thi Kim Giang**, Nguyen Viet Hung, Vu Duc Trung (2012), "Synthesis of 4-(tetra-*O*-acetyl-β-D-galactopyranosyl) thiosemicarbazone of *N*-alkylisatin", *Vietnam Journal of Chemistry* 50(5), pp. 585-590.

- Nguyen Dinh Thanh, **Nguyen Thi Kim Giang** (2013), "Reaction of *N*-alkylisatins with 4-(2,3,4,6-tetra-O-acetyl-*β*-D-glucopyranosyl)thiosemicarbazide", *Journal of Chemistry*, Hindawi (USA), 5 pages.