جامعة الملك سعود
King Saud University
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King Saud University

PHCL 490 AND PHTR 495 HANDBOOK

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I. Introduction to PHCL 490 and PHTR 495

PHCL 490 and PHTR 495 are designed to provide students with the required skills to conduct a research project in a pharmacy practice area under supervision during three semesters.
The aim of these courses is to provide students with the skills and experiences necessary to conduct and complete a research project. The research has three parts: proposal presentation, abstract and presentation submission for final research, manuscript preparation as a research article for submission to a journal research period.

II. Objectives

Through this research-based courses, students should learn to be able to:

1. Articulate a clear research question or problem and formulate a hypothesis.
2. Identify and demonstrate appropriate research methodologies and know when to use them.
3. Know existing body of research relevant to their topic and explain how their project fits.
4. Identify and practice research ethics and responsible conduct in research.
5. Know and apply problem-solving skills to constructively address research setbacks.
6. Work collaboratively with other researchers, using listening and communication skills.
7. Reflect on their own research, identifying lessons learned, strengths, and ways to improve.
8. Explain their research to others in the field and to broader audiences through research presentations.

III. Course Coordinators

Girls	Boys
PHCL 490	
Maha M. AlRasheed, PhD Assistant Professor of Pharmacogenomics Email: mahalrasheed@ksu.edu.sa	Mohammed Alarifi, PhD Professor of Clinical Pharmacy Email: malarifi@KSU.EDU.SA Tariq M. Alhawassi, PhD Assistant Professor of Clinical Pharmacy Email:tarriq@KSU.EDU.SA

Girls	Boys
PHTR 495	
Ebtehal S. Al Abdullah, Ph.D. Professor of Medicinal Chemistry Email: ealabdullah@ksu.edu.sa	Ramzi Muthana, PhD Professor of Pharmacognosy Email: rmothana@ksu.edu.sa

IV. Student Responsibilities

1. Students must exercise self-discipline in adhering to the program of work mutually agreed with the supervisory team, and to present work at the agreed times or frequency.
2. Students are expected to take principal responsibility for conducting the research project and it is their responsibility to ensure that it is completed within the regulated period of time.
3. Students should work in a group or individually under the primary supervision of KSU-College of pharmacy faculty member.
4. The course is a three consecutive semesters. During the first semester, students have to come up with a research question, contact KSU pharmacy faculty for primary supervision, plan the research objectives and methodology and work on the ethical approval. Then, in the last two semesters, data collection, analysis and writing manuscript should be completed and ready for presentation by at least one month prior to the research day date.
5. Each student has to attend the final research day
6. Throughout, students should seek to maintain good communication with the supervisory team, and regularly to apprise them of both progress and problems. Breakdown in communication between the student and supervisors should be brought to the attention of the course coordinator, at the earliest opportunity.
7. All students are required to complete and return two progress reports to the course coordinator during the course as the stated dates.
8. Official letters such as, hospital permission, KSU permission and transportation request, meeting's room booking, should be requested three days prior to the specified time from the primary supervisor's department secretary.

V. Supervision

➢ The Supervisory Team

Each student will be appointed a supervisory team. This team must include at least two members (normally not more than three). The lead supervisor must be from KSU-College of pharmacy. Supervisors should have adequate time for dedicated supervision and be reliably and regularly available to their students.

➢ Responsibilities of the supervisory team

1. Provide guidance on the management of the research project.
2. Introduction to the major sources of information in the field of inquiry.
3. Help with both general and advanced research techniques appropriate to the field of inquiry.
4. Introduce the candidate to the relevant research community.
5. Maintain regular monitoring and evaluation of the student's progress and to report on this as required.
6. To be accessible to the student at appropriate times when he or she may need advice.

VI. Evaluation and Assessment:

Students will be evaluated during the three semesters through two steps

a) **During the course (90%):** KSU supervisor will be using two evaluation forms for this purpose. In the proposal day, Proposal Presentation Evaluation Form "Appendix IV" will be used. In addition, criteria for evaluation during the course are available in Appendix V (Project Assessment Report).

b) **During the Research Day (10%):** External judges in the research day will assess each project individually and grades will be submitted

Each research group should submit the following during the three semesters:

Task	Date	Submitted to
Undergraduate Research Project Registration Form (Appendix I)	30/01/2019	Course coordinator
Signed agreement form (Appendix II)	02/03/2019	Student supervisor
First progress report (Appendix III)	11/04/2019	Course coordinator
Proposal presentation	dd/09/2019 (Date will be announced)	College of Pharmacy
Second progress report (Appendix III)	12/12/2019	Course coordinator
Research Day Abstract (Appendix IV)	dd/03/ 2020 (Deadline will be announced)	Pharmacy Research Day website
Research Day Presentation	dd/04/2020 (Date will be announced)	10th College of Pharmacy Research Day
Paper manuscript	dd/04/2020	The student's primary supervisor

*Dates are subjected to changes according to the University exam week.

➢ Proposal presentation

In consultation with their supervisors, the student will supply the information required for the proposal presentation at the beginning of the second semester of the research period, including a working title, aims and a clear and detailed plan of work. This plan of work should incorporate the background of the project, details of the research methods to be used, intended outcomes and the program of related studies.

➢ Progress reports

The aims of the progress report "Appendix III" are to assess the quality of the student's work; assess whether the supervisory relationship seems to be working sufficiently well and to investigate further if there are any difficulties; or whether the student needs an additional academic or technical support or development and advice.

- Submission of the research at the Research Day

Details of the Research Day are explained in section (Part 2). Once Research Day date has been confirmed, student's abstracts will be sent to the judges. On that day, all students will present their research. At this point, independent judges will be appointed for assessment and selection of top winners.

VII. Confidentiality

During your studies and research some of the information you may identify and/or make use of may be confidential or commercially sensitive.

Confidential information means any information, which is not in the public domain, disclosed in an oral, visual, machine-readable, written, or other tangible form, which is clearly identified as being confidential.

Confidential information should not be disclosed, circulated or published other than to a person authorized by your supervisor(s).

The College of Pharmacy therefore requires that you sign a Confidentiality Agreement prior to the commencement of your studies. "Appendix II"

VIII. Academic Dishonesty and Plagiarism

Students are expected to demonstrate professionalism and honesty during this course. Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information or citations, facilitating acts of academic dishonesty by others, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students.

IX. Ethical Approval:

The researcher should submit the request to one of the following two IRB sub-committees according to the specialization of the committee that fits with the quality of the research as follows.

A. IRB Sub-Committee for Research on Human Subjects

It is specialized in considering the research submitted to it by researchers from all faculties if the research is carried out on the human and includes clinical and pre-clinical research and all the medical research procedures carried out on the human and all the research carried out on the patients or research concern the work of medical tests or procedures in the University Medical City.

To communicate:

Jawaher Mohammed Al -Swailh
Phone: 4699491
E-mail: jsuwelih@ksu.edu.sa

B. IRB Sub-Committee for Research on Animals and Plants

It is specialized in looking at the research submitted to it by researchers from all faculties if the research requires the testing of animals and plants.

To communicate:

Dr. Abdullah bin Yassin Al Mubarak
Phone: 4692626
E-mail: ethic.rsc@ksu.edu.sa

*For more details please visit the link https://dsrs.ksu.edu.sa/ar/aboutcomm

PART 2

- RESEARCH DAY

I. What is the College of Pharmacy Research Day?

I. What is College of Pharmacy Research Day?

College of Pharmacy Research Day is an annual forum to highlight research projects of final-year undergraduate (Pharm.D. and Bachelor students) and post graduate students.
The primary goals of the Research Day are to showcase the various types of research in the college of pharmacy, share our mutual interests, and develop intra- and inter-departmental collaborations.

The ideation to organize this Research Day aims to prepare students for presenting their studies in scientific conferences. Participation in the College of Pharmacy Research Day is compulsory to all students taking this course to present their studies. Research Day provides a great opportunity to learn about the research conducted within the College of Pharmacy.

Students are required to conduct a research project during a three- semester period and present their research results at the end of their last year before graduation. The abstract should be submitted on (dd/03/2020) to the Pharmacy Research Day website using the Abstract Form "Appendix VI" one month prior to the research day (dd/04/2020) according to the updated dates.

During the Research day, all students should be attended and prepared for any question. Each group will present their research as an oral or poster presentation. Based on the topic/theme and submission details, a few posters will be selected by the research day committee for short oral presentation. For poster templates please visit the link http://pharmacy.ksu.edu.sa/en/node/2173 .

Besides, oral and poster presentations will be evaluated by a panel of distinguished professors chosen by the research day committee. Awards will be given to the winners.
For more details about the College of Pharmacy Research Day, please visit:
http://pharmacy.ksu.edu.sa/en/node/2011 .

PART 3

- APPENDICES

I. Undergraduate Research Project Registration Form

II. Agreement Form

III. Progress Reports

IV. Proposal Presentation Evaluation Form

V. Project Assessment Report: Supervisor Form

VI. Abstract Form

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I. Undergraduate Research Project Registration Form

Student's Name:	**Student's ID#:**
Supervisor(s) name:	**Course #:**

Project title:

Supervisor(s) signature

Student signature

II. Agreement Form (1)

Name of Student(s) Student's ID#: Course #:		
University Supervisor(s)	Title & Position	Institution/Department/ Telephone No
External Supervisor	Title & Position	Institution /Department / Section / Telephone No

PLEASE COMPLETE THE FOLLOWING

ROLE OF THE UNIVERSITY SUPERVISOR
Signature: _____ Date: _____

ROLE OF THE EXTERNAL SUPERVISOR
Signature: _____ Date: _____

This is an agreement between the three parties signing below that the student---------- ------- will join Dr. ---------- laboratory /site for training. It has been agreed that:

1. The student will not release, present or publish any of the work arising from his/her training without permission from his/her supervisory team.

2. The supervisor at ---------- (Dr. ----------) will include the student and the KSU supervisor in the authorship if the work becomes publishable.

We, the undersigned, agree to adhere to the above declarations and conditions following the ICMJE criteria for authorship http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html .

Signed by:

Student(s)	Date
University Supervisor(s)	Date
External Supervisor	Date

II. Agreement Form (2)

Name of Student(s) Student's ID#: Course #:		
Primary Supervisor	Title & Position	Institution/Department/ Telephone No
Secondary Supervisor	Title & Position	Institution /Department / Telephone No

PLEASE COMPLETE THE FOLLOWING

ROLE OF THE PRIMARY SUPERVISOR
Signature: _____ Date: _____

ROLE OF THE SECONDARY SUPERVISOR
Signature: _____ Date: _____

This is an agreement between the three parties signing below. It has been agreed that:

1. The student will not release, present or publish any of the work arising from his/her training without permission from his/her supervisory team.

2. The primary supervisor Dr. ---------- will include the student and the secondary supervisor Dr.----------in the authorship if the work becomes publishable.

3. The secondary supervisor Dr. ---------- will include the student and the primary supervisor Dr.----------in the authorship if the work becomes publishable.

We, the undersigned, agree to adhere to the above declarations and conditions following the ICMJE criteria for authorship http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html .

Signed by:

Student(s)	Date
Primary Supervisor(s)	Date
Secondary Supervisor	Date

Course #:_____
Progress Report (1)

III. Progress Report

(1) Initial Meeting (month)

Date of meeting:

Research title:
Research aim and objectives (to be filled by Students)
Tasks of research project for the first semester (to be filled by Students)

DECLARATION BY THE STUDENT(S)

_____

_____

Name and signature of the student (s)

……

……

DECLARATION BY SUPERVISOR(S)

_____

_____

Name and signature of the supervisor (s)

……

……

Course #:_____
Progress Report (2)

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III. Progress Report

(2) Interim Meeting (month)

Date of meeting:

Research Progress (to be filled by KSU supervisor)
Are there any specific areas that need development (particular skills?) (to be filled by KSU supervisor)

DECLARATION BY THE STUDENT(S)

_____

_____

Name and signature of the student (s)
……

……

DECLARATION BY SUPERVISOR(S)

_____

_____

Name and signature of the supervisor (s)
……

……

IV. Proposal Presentation Evaluation Form

Presenter's Name: Course #:			Total Points (A):	
Seminar Title:			Total Criteria (B; 16 if all evaluated):	
Seminar Date:			Final Points: {A/(B*3)]*50 =	
Evaluator:			(100% = 50 pts)	
CATEGORY	1 (Unacceptable) 0 pt	2 (Requires Improvement) 1pt	3 (Acceptable) 2 pts	4 (Exemplary) 3 pts
Nonverbal Communication				
Eye contact	• Uncomfortable, either lacking or excessive• Relies on notes excessively, detracting from presentation	• Relies on notes often or faces slides often, which detracts from presentation	• Appropriate• Relies on notes or handouts occasionally, which does not affect presentation	• Varied, comfortable, and natural • Refers to notes or handouts minimally
Body language	• Not poised and detracts from presentation	• Not poised but does not detract from presentation	• Reasonably poised and polished	• Poised and polished • Avoids distracting mannerisms
Confidence **E.g. "sort of", "kind of"*	• Lacks confidence, appears nervous• Frequent use of "hedging terms"*	• Requires improvement in confidence displayed or is overconfident• Use of "hedging terms"*	• Appropriate confidence is displayed• Avoids use of "hedging terms"*	• Appears confident and assertive • Avoids use of "hedging terms"*

Handout material (topic, objectives, main body, discussion questions, references, etc)	• Does not contain required elements as outlined in the course syllabus	• Contains required elements but is difficult to read/see content	• Contains required elements but adds little to the presentation	• Contains required elements and enhances the presentation
Verbal Communication				
Response to audience questions	• Is unable to answer questions from the audience or answers are inappropriate	• Rambles when answering questions; is not precise when answering questions • Does not repeat questions or clarify when necessary	• Repeats the question • Provides complete answer but could be more precise or confident • Admits when does not know answers and offers to follow up	• Repeats the question; clarifies question if necessary • Answers questions completely with confidence • Admits when does not know answers and offers to follow up
Use of fillers (e.g., ah, um, uh, so)	• Fillers are frequent and detract from the presentation	• Fillers are frequent and detract from the presentation	• Some fillers noted, however these are minimal and do not detract from the presentation	Avoids use of fillers during the presentation
Jargon, pronunciation, & modification *Presents at the level of classmates as healthcare professionals	• Uses of jargon or slang terms• Words used (e.g. medical terminology or drug names) are mispronounced • Does not modify communication to meet special needs of the individual/audience*			• Information is stated clearly• Words used (e.g. medical terminology or drug names) are pronounced correctly • Modifies communication to meet special needs of the individual/audience*
Organization, flow, and focus	• Does not utilize transitions, leading to a disorganized presentation with poor	• Occasional use of transitions• Presentation is somewhat choppy and disorganized• Focus may be on different items		• Clear transitions and smooth delivery leads to a well-organized Presentation• Flows logically

	flow• Focus is unclear	simultaneously		
Time management and pace	• Use of time is poor (too fast or too slow) or balance of material is not appropriate	• Covered key information but was rushed (poor pacing) or mismanaged time		• Uses time effectively with good pacing, and balance of the material of the presentation was appropriate
Tone and volume	• Tone is demeaning at any point during the interaction• Volume is not appropriate (e.g., too loud or too low)	• Tone and/or volume makes understanding of information somewhat difficult	• Tone and volume are appropriate	• Exhibits finesse and command of tone and volume (e.g., speaks audibly and clearly throughout the presentation)
Content (project)				
Level of presentation	• Presentation is too basic for the audience, should be more complex/analysis of information	• Presentation has some complexity/analysis of information but not as in depth as it should be	• Presentation is at the level of the audience (P4 students/entry-level pharmacists) • Presentation has appropriate complexity/analysis of information	• Presentation is at the level of the audience (P4 students/entry- level pharmacists)• Presentation has appropriate complexity/analysis, reflecting the specific consideration in that area
Balance (background vs. methods vs. results)	• Presentation is unbalanced (too much information in some areas and not enough in others)	• Presentation is balanced • Does not appropriately address all components of research	• Presentation is balanced• Appropriately addresses all components of research	• Presentation is balanced• Appropriately addresses all components of research in a clear and concise manner
Analysis of literature (background and significance; specific aim/hypothesis)	• Minimal or no attempt at analysis • Background materials are not pertinent	• Background materials are pertinent but lack comprehensive analysis• Specific aim/hypothesis not clearly stated	• All materials are current and pertinent• Average analysis, reflects use of basic principles of literature analysis • Specific aim/hypothesis is stated and reflects analysis of	• All materials are current and pertinent• Excellent analysis, reflecting understanding of research methods and/or specific consideration in that area • Specific aim/hypothesis is clearly

			literature	stated and reflects analysis of literature
Synthesis and interpretation of data (methods and results)	• Minimal understanding of study design and methods	• Some understanding of study design and methods • Results presented lack details or are disorganized	• Presented study design, methods and results clearly with sufficient details	• Presented study design, methods and results clearly with sufficient details• Appropriately discusses strengths and limitations of the study
Conclusion	• No conclusion provided	• Conclusion provided but does not reflect accurate inference of the results presented	• Is able to draw reasonable conclusions from the results presented	• Is able to draw reasonable conclusions from the results presented• Appropriately discusses future direction and implication of the research
Discussion questions	• No discussion questions provided	• Questions are not well written or do not emphasize important points • Asks multiple questions simultaneously, not giving the audience time to respond	• Questions are well written and emphasize important points• Questions do not engage audience	• Engages audience• Allows adequate time for audience response

V. Project Assessment Report: Supervisor Form

Supervisor's Name: _____ Course #: _____

Student's Name: _____ Student's ID #: _____

Score: 90% of the total score

CATEGORY	4	3	2	1
Hypothesis Development	Independently developed a hypothesis well substantiated by a literature review and observation of similar phenomena.	Independently developed a hypothesis somewhat substantiated by a literature review and observation of similar phenomena.	Independently developed a hypothesis somewhat substantiated by a literature review or observation of similar phenomena.	Needed mentor assistance to develop a hypothesis or to do a basic literature review.
Description of Methodology	Methods were outlined in a step-by-step fashion that could be followed by anyone without additional explanations. No mentor help was needed to accomplish this.	Methods were outlined in a step-by-step fashion that could be followed by anyone without additional explanations. Some mentor help was needed to accomplish this.	Methods were outlined in a step-by-step fashion, but had 1 or 2 gaps that require explanation even after mentor feedback had been given.	Methods that were outlined were seriously incomplete or not sequential, even after mentor feedback had been given.
Organization	Information is very organized with well-constructed paragraphs and subheadings.	Information is organized with well-constructed paragraphs.	Information is organized, but paragraphs are not well constructed.	The information appears to be disorganized. 8)
Amount of Information	All topics are addressed and all questions answered with at least 2 sentences about each.	All topics are addressed and most questions answered with at least 2 sentences about each.	All topics are addressed, and most questions answered with 1 sentence about each.	One or more topics were not addressed.

Quality of Information	Information clearly relates to the main topic. It includes several supporting details and/or examples.	Information clearly relates to the main topic. It provides 1-2 supporting details and/or examples.	Information clearly relates to the main topic. No details and/or examples are given.	Information has little or nothing to do with the main topic.
Sources	All sources (information and graphics) are accurately documented in the desired format.	All sources (information and graphics) are accurately documented, but a few are not in the desired format.	All sources (information and graphics) are accurately documented, but many are not in the desired format.	Some sources are not accurately documented.
Mechanics	No grammatical, spelling or punctuation errors.	Almost no grammatical, spelling or punctuation errors	A few grammatical spelling, or punctuation errors.	Many grammatical, spelling, or punctuation errors.
Plan for Organizing Information	Students have developed a clear plan for organizing the information as it is gathered and in the final research product. All students can independently explain the planned organization of the research findings.	Students have developed a clear plan for organizing the information in the final research product. All students can independently explain this plan.	Students have developed a clear plan for organizing the information as it is gathered. All students can independently explain most of this plan.	Students have no clear plan for organizing the information AND/OR students in the group cannot explain their organizational plan.
Delegation of Responsibility	Each student in the group can clearly explain what information is needed by the group, what information she is responsible for locating, and when the information is needed.	Each student in the group can clearly explain what information she is responsible for locating.	Each student in the group can, with minimal prompting from peers, clearly explain what information she is responsible for locating.	One or more students in the group cannot clearly explain what information they are responsible for locating.
Group Timeline	Group independently develops a reasonable, complete timeline describing when different parts of the work (e.g.,planning, research, first draft, final draft) will be done. All students in-group can independently	Group independently develops a timeline describing when most parts of the work will be done. All students in-group can independently describe the high points of the timeline.	Group independently develops a timeline describing when most parts of the work will be done. Most students can independently describe the high points of the timeline.	Group needs mentor help to develop a timeline AND/OR several students in the group cannot independently describe the high points of the timeline.

	describe the high points of the timeline.			
First Draft for publication	Detailed draft is neatly presented and includes all required information.	Draft includes all required information and is legible.	Draft includes most required information and is legible.	Draft is missing required information and is difficult to read.
Paragraph Construction	All paragraphs include introductory sentence, explanations or details, and concluding sentence.	Most paragraphs include introductory sentence, explanations or details, and concluding sentence.	Paragraphs included related information but were typically not constructed well.	Paragraphing structure was not clear and sentences were not typically related within the paragraphs.
Graphic Organizer	Graphic organizer or outline has been completed and shows clear, logical relationships between all topics and subtopics.	Graphic organizer or outline has been completed and shows clear, logical relationships between most topics and subtopics.	Graphic organizer or outline has been started and includes some topics and subtopics.	Graphic organizer or outline has not been attempted.
Diagrams & Illustrations	Diagrams and illustrations are neat, accurate and add to the reader's understanding of the topic.	Diagrams and illustrations are accurate and add to the reader's understanding of the topic.	Diagrams and illustrations are neat and accurate and sometimes add to the reader's understanding of the topic.	Diagrams and illustrations are not accurate OR do not add to the reader's understanding of the topic.
Conclusion/Summary	Student provided a detailed conclusion clearly based on the data and related to previous research findings and the hypothesis statement(s).	Student provided a somewhat detailed conclusion clearly based on the data and related to the hypothesis statement(s).	Student provided a conclusion with some reference to the data and the hypothesis statement(s).	No conclusion was apparent OR important details were overlooked.
Appropriate professional skills (timeliness, independence, level of engagement, communication with supervisor)	Independently and consistently exhibited suitable professional skills.	Required minimal feedback/input regarding professional skills.	Required moderate feedback/input regarding appropriate professional	Failed to exhibit appropriate professional skills.

VI. Abstract Form

ABSTRACT FORM
10TH COLLEGE OF PHARMACY RESEARCH DAY
COLLEGE OF PHARMACY
KING SAUD UNIVERSITY

Office Use:
No.
[_____]
_____
_____

Abstract will be evaluated by the Scientific Committee
and will be selected as poster or oral presentation based on the Research Day criteria

GENERAL INFORMATION:
Submission of an abstract constitutes a commitment by the author (s) to present the abstract as accepted.

Submitted for:
- ☐ Oral or Poster Presentation
- ☐ Poster Presentation

Theme:
- ☐ Pharmacy Practice
- ☐ pharmacology and toxicology
- ☐ Physical Pharmacy & Pharmaceutics
- ☐ Medicinal Chemistry & Natural products
- ☐ Others

Level:
- ☐ BSc Pharm
- ☐ Pharm D
- ☐ MSc
- ☐ PhD
- ☐ Resident

Structure: If Not applicable leave blank

TITLE:

ABSTRACT: [**(250 words maximum)**

Background
Patients with differentiated thyroid cancer (DTC) are managed by total thyroidectomy and radioiodine ablation of the remnant thyroid tissue, requiring L-Thyroxine (LT4) therapy for replacement and thyroid stimulating hormone (TSH) suppression. There is wide variation in L-T4 dose requirement, possibly due to an underlying genetic cause. Therefore, this study aims to identify single nucleotide polymorphisms (SNPs) of 6 genes comprising 3 deiodinases (*DIO1*, *DIO2* and *DIO3*), TSH receptor Beta, PAX8 transcription factor and sodium iodine symporter (*NIS*), involved in thyroid hormone metabolism/action and evaluate their possible association with L-T4 dose requirements and with the risk of developing DTC in Saudi population.

Methods
SNPs were identified by sequencing of the genes in 200 individuals using the MegaBACE DNA analysis system, and data analyzed by DNASTAR Lasergene Software. Association studies for 3 *NIS* SNPs (rs4808708, rs4808709 and rs7250346) were accomplished in 409 cases versus 406 controls by rtPCR using Taqman chemistry with the ABI Prism 7900HT Sequence Detection System.

Results
Overall, 225 SNPs were captured, comprising 62 novel, 11 nonsynonymous and 9 insertion/deletion polymorphisms. Thus far, association experiments were performed on 3 *NIS* variants showing that the G allele [Odds ratio(95%CI)=1.30(1.05-1.60); p=0.016] and the AG+GG genotypes [1.38(1.05-1.82); p<0.05] of the rsXXXA>G are significantly associated with DTC, independent of age and sex. No association was found for any of these SNPs with L-T4 dose.

Conclusions
We identified rsXXX as a risk variant for DTC. The variability in the L-T4 dose requirement does not appear to be related to *NIS* polymorphisms.]

Student(s) Name:[ ]

Supervisor(s) Name: []