

1. SYNOPSIS

Company: Impax Laboratories Inc., acting through its Impax Pharmaceuticals division (Impax)	Individual Study Table Referring to Part of the Dossier	<i>For National Authority Use Only</i>
Investigational Product: IPX066	VOLUME:	
Active ingredient: Carbidopa-Levodopa	PAGE:	
Title: A Study to Compare IPX066 and Carbidopa/Levodopa/Entacapone (CLE) followed by an open-label safety study of IPX066 in Advanced Parkinson’s Disease (Part I)		
Principal Investigator: Fabrizio Stocchi, MD, U.O. Riabilitazione Neuromotoria IRCCS San Raffaele Pisana via della Pisana 235, Roma, Italy. Twenty-eight other investigators participated in the study.		
Study Center(s): This multicenter study was conducted by 13 Investigators at 13 study sites located in the United States and 16 Investigators at 16 study sites located in the European Union.		
Publication (Reference): None		
Study period: First subject treated: June 8, 2010 Last subject completed: July 6, 2011	Phase of Development: 3	
Objectives: Part 1 of the study: to compare the efficacy of IPX066 (carbidopa-levodopa extended-release [ER] capsules) carbidopa-levodopa-entacapone (CLE) treatment and to assess the pharmacokinetics and pharmacodynamics of IPX066 and CLE in subjects with advanced Parkinson’s disease (PD).		
Methodology: The study was conducted in two parts. Part 1 was a randomized, double-blind, double-dummy, 2-treatment, 2-period crossover study to assess the efficacy and safety of IPX066 using CLE as an active control. Part 2 is an open-label extension study. This synopsis focuses on Part 1 of the study. Enrolled subjects were converted to IPX066 over a 6-week period. After dose conversion, subjects were randomized to receive double-blind IPX066 followed by CLE or CLE followed by IPX066 (2 weeks/treatment). Subjects received 1-week of open-label IPX066 treatment between the 2 treatment periods. During each double-blind treatment period, efficacy was assessed using a subject PD diary, United Parkinson’s Disease Rating Scale (UPDRS), and Subject Preference of Treatment. In addition, data on Health Related Quality of Life States (EQ-5D), Health Survey Questionnaire (SF-36) and Parkinson’s Disease Sleep Scale (PDSS) were also collected. A subset of subjects had pharmacokinetic (PK) and pharmacodynamic (finger tapping, UPDRS Part III, and Investigator Dyskinesia Assessment) assessments on Day 1 of each treatment period.		
Number of Subjects (Planned and Analyzed): A total of 96 subjects were planned for enrollment, 146 subjects were screened, 110 were enrolled, 91 were randomized, and 84 completed the study. Primary efficacy and other PD diary endpoints included 83 subjects who had evaluable diary data. The other efficacy analyses (UPDRS, EQ-5D, SF-36, and Subject Preference of Treatment) included data from 84 subjects who completed both periods. Sensitivity analysis included data from all 91 subjects randomized. The PK cohort enrolled 42 subjects, of which 33 subjects randomized, and 32 completed both periods. Pharmacokinetic and pharmacodynamic data from the 32 subjects who completed both periods were analyzed.		
Diagnosis and Main Criteria for Inclusion:		

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<p>Key inclusion criteria included: idiopathic PD per United Kingdom Parkinson's Disease Society Brain Bank Diagnostic Criteria; Hoehn and Yahr Staging I-IV in the "On" state; ≥ 30 years old at PD diagnosis, currently treated with stable levodopa (LD) regimen (≥ 400 mg LD/day, CLE dosed ≥ 4 times/day and stable for ≥ 4 weeks at Screening); able to differentiate "On" state from "Off" state with 75% concordance rate during training; averaging ≥ 2.5 hours "Off" time at Visits 1 and ≥ 1 hour "Off" each day based on 3 days of diary; able to properly complete diary, had predictable "Off" periods ("yes" to Question #36 on the UPDRS).</p>		
<p>Reference Therapy:</p> <p>For the orally administered reference active control CLE treatment, the subject's pre-study CLE regimens, which may be combination of IR CD-LD or IR benserazide-LD alone or in combination with entacapone or Stalevo® with or without co-administration of IR CD-LD or IR benserazide-LD, were directly replaced with corresponding doses of IR CD-LD and entacapone. For IR CD-LD, Sinemet® (25-100 mg) was provided; for entacapone, Comtan® (entacapone 200 mg) was provided during the study.</p>		
<p>Dose and Mode of Administration:</p> <p>The investigational product was IPX066, an ER oral capsule formulation of CD-LD (1:4 ratio). IPX066 was provided in four dosage strengths (expressed in LD dose): 95 mg, 145 mg, 195 mg, and 245 mg. The IPX066 dose was individually adjusted over a 6 week period, based on the suggested initial dose conversion table. The CLE dose was the same as the subject's baseline CLE dose.</p>		
<p>Drug Lot (Batch) Numbers Used:</p> <p>The investigational product was IPX066 and the following lot (batch) numbers were used in the study: 95 mg (Lots RB09042-120, RB10014-120, RB10003-120), 145 mg (Lots RB09041-120, RB10004-120, RB10015-120), 195 mg (Lots RB09040-120, RB10005-120, RB10016-120), and 245 mg (Lots RB09039-120, RB10006-120, RB10017-120).</p> <p>The IR CD-LD CLE treatment was provided as 25 – 100 mg CD-LD tablets (Nacom: Lots RB10001-200 and RB10027-200), and entacapone tablets, provided as Comtan (Lots PB00310-100 and PB00610-100).</p>		
<p>Duration of Treatment:</p> <p>The total duration of treatment for Study Part 1 was approximately 11 weeks. Subjects received 6 weeks of IPX066 during the Dose Conversion, followed by IPX066 and CLE, each for 2 weeks in a double-blind, randomized fashion. There was a 1-week open-label treatment with IPX066 between the 2 double-blind treatments.</p>		
<p>Criteria for Evaluation:</p> <p>PD diary were collected for 3 days immediately prior to Visit 1, end of dose conversion (Visit 4), end of each double-blind crossover treatment period (Visits 5 and 7). UPDRS were assessed Visits 1, 5, and 7. Subject Preference of Treatment was assessed on Visit 7. EQ-5D, SF-36, and PDSS were assessed at Visits 1, 4, 5, and 7. For the subset of PK cohort, the UPDRS Part III, Finger Tapping, and Investigator assessment of dyskinesia were assessed at predose and over an 8-hour period after the morning dose on Day 1 of each double-blind treatment period.</p> <p><i>Primary Efficacy:</i></p> <p>Percentage of "off" time during waking hours, derived from subjects' PD Diary collected for</p>		

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<p>3 days immediately prior to the end of each double-blind crossover treatment period.</p> <p><i>Key Secondary efficacy:</i></p> <ul style="list-style-type: none"> • Total “Off” time (in hours) • Total “On” time with no troublesome dyskinesia (sum of “On” time with no or non-troublesome dyskinesia) • UPDRS Parts II + III • Subject Preference of Treatment <p><i>Additional analyses on Primary Efficacy endpoint:</i></p> <ul style="list-style-type: none"> • Sensitivity analysis including all 91 randomized subjects using predefined imputation method • Responder analysis: comparing proportion of subjects with at least 0.5, 1, 1.5, 2, and 3 hour improvements from baseline. <p><i>Other Secondary Efficacy Measures:</i></p> <ul style="list-style-type: none"> • “On” time with no dyskinesia • “On” time with non-troublesome dyskinesia • “On” time with troublesome dyskinesia • Asleep time • UPDRS individual Parts and Total UPDRS (sum of all 4 Parts), Part II assessed for the “Off” state <p><i>Quality of Life and Health Related Endpoints:</i></p> <ul style="list-style-type: none"> • Health Related Quality of Life States (EQ-5D) • Health Survey Questionnaire (SF-36) • Parkinson’s Disease Sleep Scale (PDSS) <p><i>Pharmacodynamics:</i></p> <ul style="list-style-type: none"> • UPDRS Part III determined hourly • Finger Tapping determined every 30,minutes • Investigator Dyskinesia Assessment of subject’s motor state as “Off”, “On” with no dyskinesia, “On” with non-troublesome dyskinesia, “On” with troublesome dyskinesia, or asleep determined every 30 minutes • Onset of effect and duration of effects for PK cohort were assessed by comparing Finger Tapping and UPDRS Part III scores throughout the 8-hour period. Total “Off” time and “On” with no troublesome dyskinesia were also used to assess duration of effects • Responder analyses (20% improvement from baseline) were assessed for Finger Tapping and UPDRS Part III. <p><i>Pharmacokinetics:</i> Plasma samples for the determination of CD and LD were collected from each of the PK subjects at predose and 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 7, and 8 hours after dosing on Day 1 of each double-blind treatment period.</p> <p><i>Safety:</i> Vital signs were measured at all study visits; 12-lead ECGs and clinical laboratory studies were performed at screening and termination visit of Study Part 1. Safety laboratory assessments</p>		

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<p>and physical examinations were performed at screening and at study termination. Adverse events were actively solicited and collected as reported by the subject throughout the study. Concomitant medications were also collected at screening and throughout the study.</p>		
<p>Statistical Methods:</p> <p><i>Efficacy/Pharmacodynamics:</i> Descriptive statistics were calculated for the efficacy/pharmacodynamic parameters. For this crossover study, efficacy data, including diary and UPDRS data were analyzed using a standard mixed-model analysis of variance at a 0.05 level of significance, including the fixed-effect factors of treatment, sequence and period and the random-effect inter- and intra-subject factors. Pharmacodynamic data collected over 8 hours during PK days were compared as mean across all time points for all pharmacodynamics endpoints and at each time point for UPDRS Part III and finger tapping. The analysis method for Investigator Dyskinesia Assessment was similar to the analysis for the efficacy endpoints. Since pre-dose assessments were available for UPDRS Part III and finger tapping, these two endpoints were analyzed with mixed-model analysis of variance using predose data as a covariate. Subject Preference of Treatment was analyzed using chi-square analysis. Responder analyses were performed for “Off” time (primary efficacy) and for UPDRS Part III and Finger Tapping collected during PK days. Duration and onset of effect were explored by comparing UPDRS Part III and Finger Tapping scores throughout the 8-hour period. Total “Off” time and “On” with no troublesome dyskinesia were also used to explore duration and onset of effects.</p> <p><i>Pharmacokinetics:</i> Descriptive statistics were calculated for PK parameters (maximum concentration [C_{max}], time to maximum drug concentration [T_{max}], area under the concentration-time curve [AUC]) and the bioavailability of IPX066 relative to CLE based on PK data on Day 1 following a single-dose of IPX066 and CLE.</p> <p><i>Safety:</i> AEs, vital signs, physical examinations, concomitant medications, ECGs, and clinical laboratory data were tabulated for all subjects.</p>		
<p>Results:</p> <p>Of the 110 subjects enrolled, 51 subjects were enrolled at 12 study sites in the US and 59 subjects were enrolled at 12 sites in the EU. The mean age of the subjects was 64.6 ± 9.1 years. The 84 subjects who completed both treatment periods had similar demographics to the 110 subjects who were enrolled and the 91 subjects who were randomized. Most enrolled subjects were white (98.2%) and male (69.1%). Of the 91 subjects who were randomized, mean age of PD onset was 54.1 years, and duration of PD was 10 years, screening UPDRS Part II+III was 34.4. Seven subjects (4 males and 3 females) discontinued the study early post-randomization.</p> <p>Efficacy Results</p> <p>The efficacy results based on data obtained in this study showed that IPX066 was superior to CLE in improving the PD symptoms in advanced PD subjects with motor fluctuations. Based on Parkinson’s Disease diary data from the 83 subjects who completed the diary for both periods:</p> <ul style="list-style-type: none"> Percent “Off” time during waking hours was significantly reduced from a mean of $36.08\% \pm 16.29\%$ at baseline to $23.98\% \pm 16.24\%$ with IPX066 treatment compared to $32.48\% \pm 21.92\%$ with CLE treatment ($P < 0.0001$). 		

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<ul style="list-style-type: none"> When examined over time, the “Off” time reduced 2.16 hours to 3.72 ± 2.51 hours at end of dose conversion from an average of 5.88 ± 2.66 hours per day at Baseline ($P < 0.0001$). At end of double-blind cross-over study, the “Off” time was maintained at 3.82 ± 2.56 hours during IPX066 treatment while deteriorated back to 5.22 ± 3.67 hours during CLE treatment. Relative to CLE treatment, IPX066 has a mean of 1.4 hours less “Off” time and 1.38 hours more “On” time with no troublesome dyskinesia (11.36 hours for IPX066 vs. 9.98 hours for CLE). The “On” time with troublesome dyskinesia and sleep time were not significantly different between the two treatments. <p>The combined UPDRS Part II plus Part III score for the 84 completers averaged 32.0 at Baseline, 29.3 during IPX066 treatment, and 31.7 during CLE treatment ($P = 0.0233$). The improvement in total UPDRS was also significant compared to CLE treatment ($P = 0.0496$).</p> <p>A majority of the subjects (52.38%) preferred IPX066 treatment while 27.38% preferred CLE treatment and 20.24% had no preference at the end of this study ($P = 0.0008$).</p> <p>Benefits of IPX066 in the individual measures of the EQ-5D and SF-36 were demonstrated compared to CLE although the results were not statistically significant in general.</p> <p>PK/Pharmacodynamic Results</p> <p>For the PK subjects, based on the UPDRS Part III scores collected hourly, effectiveness is comparable for the first 2 hours between the two treatments. The UPDRS Part III scores were significantly different between the two treatments starting at 3 hours post dosing and the superiority continued until 6 hours post dose. With the comparable effects for the first 2 hours, the two treatments appeared to have similar onset of effect. With the superiority at Hours 3 to 6, IPX066 clearly has a longer duration of effect after a single dose.</p> <p>The mean bioavailability of LD from IPX066 relative to CLE was 46.9% and 28.4% for AUC and C_{max}, respectively. The bioavailability of CD from IPX066 relative to CLE was 42.2% and 33.2% for AUC and C_{max}, respectively.</p> <p>The dosing frequency averaged 3.5 times/day (median: 3 times/day) with IPX066 and 5 times/day (median: 5 times/day) with CLE.</p> <p>The median daily dose for the randomized subjects was 1560 mg for IPX066 and 600 mg for CLE. Accounting for the relative bioavailability of LD from IPX066, the systemic exposure to LD from IPX066 was approximately 22% higher than CLE treatment.</p>		
<p>Safety Results:</p> <p>No deaths occurred during Part 1 of this study. Four subjects reported 6 on-treatment SAEs (as preferred term: hypercalcaemia, dehydration, atrial fibrillation, gastrointestinal toxicity (excessive laxatives), constipation, and sciatica) during treatment with IPX066, but none was</p>		

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<p>assessed by the Investigators as “related” to study drug.</p> <p>Two subjects prematurely discontinued from the study due to at least one AE (one reported dyspepsia/nausea/vomiting and one reported dyskinesias). The first early termination occurred during the 6-week Dose Conversion period and was secondary to reports of 3 gastrointestinal system AEs (dyspepsia, nausea, and vomiting). The second early termination occurred during the IPX066 washout period, when one subject withdrew early because of dyskinesias.</p> <p>Adverse events for IPX066 in this study were consistent with those reported for current commercially available CD-LD formulations. Throughout the 11-week study period, 30.9% of subjects reported at least one AE during the Dose Conversion period, 20.2% during IPX066 treatment in the double-blind crossover treatment periods, and 13.5% during 1-week washout between the 2 double-blind crossover treatment periods.</p> <p>Adverse events during IPX066 treatment were mostly mild or moderate; 2 (1.8%) subjects reported severe AEs during the Dose Conversion period and 5 (5.6%) subjects reported severe AEs during the double-blind crossover part of the study. During double-blind CLE treatment one (1.1%) subject reported a severe AE.</p> <p>Adverse events suggestive of too much CNS dopamine were recorded only infrequently with nausea being the only AE that was reported by more than 5% of subjects (7.3%) and/or vomiting reported by approximately 3% of subjects during the Dose Conversion period.</p> <p>During the double-blind crossover portion, AEs were reported by more subjects during IPX066 treatment (20.2%) than during CLE treatment (13.6%). Individual AEs reported by at least 2% of subjects during IPX066 treatment were dyskinesia (4 subjects, 4.5%), confusional state (3 subjects, 3.4%), insomnia (3 subjects, 3.4%), and, during CLE treatment, fall reported by 2 subjects (2.3%).</p> <p>No AEs were reported by more than 5% of subjects during double-blind crossover treatment with IPX066. During the open-label IPX066 washout period of the double-blind crossover portion of the study, no single AE was reported by more than one subject.</p> <p>No clinically relevant patterns of change were noted in blood and urine laboratory studies, ECGs and vital signs, although individual abnormalities were seen. In this 11-week study, IPX066 demonstrated a favorable safety profile in these mostly older subjects with advanced PD, most of whom had multiple other medical co-morbidities.</p>		
<p>Conclusions:</p> <p>While dosing less frequently (averaging 3.5 vs. 5.0 doses per day), IPX066 treatment was statistically significantly superior over CLE treatment:</p> <ul style="list-style-type: none"> • in providing a greater improvement in “Off” time averaging 1.4 hours per day 		

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<ul style="list-style-type: none"> • in providing a greater increase in “On” time with no troublesome dyskinesia averaging 1.38 hours per day • in improving UPDRS Parts II+III averaging 2.4 points • A majority of the subjects (52.38%) preferred IPX066 treatment while 27.38% preferred CLE treatment and 20.24% had no preference at the end of this study (P=0.0008) <p>The “On” time with troublesome dyskinesia and time asleep were not statistically significantly different between the two treatments.</p> <p>For the subset of PK subjects, based on the UPDRS Part III scores collected hourly, effectiveness is comparable for the first 2 hours between the two treatments. The UPDRS Part III scores were significantly different between the two treatments starting at 3 hours postdosing and the superiority continued until 6 hours postdose. With the comparable effects for the first 2 hours, the two treatments appeared to have similar onset of effect. With the superiority at Hours 3 to 6, IPX066 clearly has a longer duration of effect after a single dose.</p> <p>The mean bioavailability of LD from IPX066 is 46.9% relative to CLE. IPX066 was dosed less frequently than CLE (mean of 3.5 vs 5.0 doses/day; median: 3 vs. 5 doses per day).</p> <p>IPX066 was well tolerated during this study; there were only 2 subjects who withdrew from the study due to an AE. The only AE reported by $\geq 5\%$ of subjects was nausea, reported in 7.3% of subjects during the Dose Conversion period. Four subjects reported SAEs: two subjects during open-label Dose Conversion period on IPX066, one subject during IPX066 double-blind treatment, and one subject during the week of IPX066 washout between the two double-blind treatment periods.</p> <p>In this study, IPX066 treatment demonstrated significant improvement over CLE therapy in treating PD symptoms in advanced PD patients with motor fluctuations.</p>		
Date of the report: 05 December 2011		

2. SYNOPSIS

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Name of Finished Product: IPX066		
Name of Active Ingredient: Carbidopa-Levodopa		
Title of Study: A Study to Compare IPX066 and Carbidopa/Levodopa/Entacapone (CLE) Followed by an Open-Label Safety Study of IPX066 in Advanced Parkinson's Disease		
Principal Investigator: Dr. Stocchi		
Investigators: 20 Investigators (10 in the United States and 10 in Europe)		
Study center(s): 20 Multicenter, International Investigative Sites (10 each in the United States and Europe).		
Publications (reference): None		
Studied period (years): Date first patient enrolled: March 22, 2011 Date last patient completed: January 12, 2012		Phase of development: 3
Objectives: To evaluate long-term safety and clinical utility of IPX066 under open-label conditions in eligible subjects who successfully completed Part 1 of the study.		
Methodology: This was a phase 3, open-label extension study that enrolled eligible subjects who had successfully completed Part 1 of study IPX066-B09-06. Part 1 "Completers" were defined as subjects who successfully completed Part 1 by June 30, 2011 and elected to participate in Part 2. This open-label extension study was designed to gain additional safety experience with IPX066 in advanced PD subjects.		
Number of patients (planned and analyzed): 74 subjects were enrolled and 66 subjects completed Part 2.		
Diagnosis and main criteria for inclusion: For inclusion into Part 2, subjects were required to have successfully completed Part 1 of IPX066-B09-06 as of June 30, 2011; and in the opinion of the Investigator, the Parkinson's Disease (PD) diagnosis was still valid, and the subject remained eligible for levodopa (LD) therapy.		
Test product, dose and mode of administration, batch number: The study medication was IPX066, an extended-release (ER) multiparticulate, oral capsule formulation of carbidopa (CD) and LD in a 1:4 ratio. IPX066 was supplied in the following dosage strengths and lot numbers: <ul style="list-style-type: none"> • IPX066 23.75 – 95 mg CD-LD capsules: Lots CL1103 and CL1115 • IPX066 36.25 - 145 mg CD-LD capsules: Lots CL1104 and CL1111 • IPX066 48.75 – 195 mg CD-LD capsules: Lots CL1105 and CL1112 • IPX066 61.25 – 245 mg CD-LD capsules: Lots CL1106 and CL1113 		
Duration of treatment: Up to 6 months.		
Reference therapy, dose and mode of administration, batch number: None		

Criteria for evaluation:

At Baseline, Month 3 and Month 6, clinical utility for Part 2 was evaluated using the Unified Parkinson's Disease Rating Scale (UPDRS) Parts I to IV: Part I Mentation, Behavior, and Mood; Part II Activities for Daily Living (ADL); Part III Motor Examination; and Part IV Complications of Therapy. Of particular interest is the sum of UPDRS Parts II and III in the "On" state. Additionally, the total UPDRS score, the score of individual Parts of the UPDRS in the "On" state and the UPDRS Part II score in the "Off" state were examined.

Safety: At Baseline, Month 3, and Month 6 safety was assessed by collecting adverse events (AEs), concomitant medications, and vital signs. Additionally, at Baseline and at Month 6 safety was assessed by clinical laboratory studies (hematology, chemistry, urinalysis), 12-lead electrocardiogram (ECGs), and physical examinations.

SUMMARY – CONCLUSIONS**CLINICAL UTILITY/DOSING:**

The 74 enrolled subjects had a mean decrease in the UPDRS Part II and Part III scores of approximately 5.3 units from Screening to the end of Part 1. At the end of the 6-month extension, the 66 subjects who completed the study successfully had a mean increase of 2.0 units in UPDRS Parts II and III scores compared to the end of Part 1. While this was a slight worsening from the end of Part 1, the mean 6-month UPDRS scores were still improved over Screening. After being treated with IPX066 for 6 months under open-label conditions, 45% of subjects took IPX066 three times per day and 34% of subjects took IPX066 four times per day. A total of 72% of subjects maintained the same dosing frequency as they used during the controlled phase of Part 1.

SAFETY RESULTS:

The safety results for this study are:

- Adverse events in Part 2 compared to Part 1 did not show any new patterns or trends. The most frequent AEs that occurred in at least 2 subjects were anxiety, dyskinesia, constipation, dizziness, and fatigue.
- Three subjects died (4.1%) during Part 2. The causes of death were different for each subject and included: pneumonia, aspiration, and acute myocardial infarction. None of these deaths were considered by the Investigator to be related to IPX066. Additionally, one subject terminated the study early due to an AE of anxiety.
- A total of 8 subjects reported 11 SAEs that all occurred during Part 2. All SAEs were single reports. Two SAEs were considered by the Investigator to be related to study medication: dyskinesia and angina pectoris.
- No clinically relevant patterns of change were noted in blood and urine laboratory assessments, ECGs, or vital signs, although individual abnormalities were seen.
- IPX066 demonstrated a favorable safety profile over an extended duration of dosing in mostly older subjects with PD, most of whom had multiple medical comorbidities.

CONCLUSIONS:

The conclusions for this study are:

- At the end of the 6-month extension Part 2 study, the 66 subjects who completed the study successfully had a mean increase of 1.8 units in the UPDRS Part II and Part III scores compared to the end of Part 1. While this is a slight worsening from the end of Part 1, the mean 6-month UPDRS scores were improved from Screening.
- After 6 months of open-label treatment with IPX066, the total daily dose of IPX066 remained stable compared to that used during the controlled phase of Part 1. The majority of subjects (72%) maintained their dosing frequency throughout Part 1 and Part 2 of the study.
- Adverse events in Part 2 compared to Part 1 did not show any new patterns or trends. The most frequent AEs that occurred in at least 2 subjects were anxiety, dyskinesia, constipation,

Clinical Study Report

dizziness, and fatigue.

- No clinically-relevant patterns of change were noted in blood and urine laboratory assessments, ECGs, or vital signs.
- IPX066 demonstrated a favorable safety profile over an extended duration of dosing in subjects with advanced PD, many of whom had multiple medical comorbidities.

Date of the report: September 11, 2012